DOCUMENT RESUME

ED 468 705 SP 041 013

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|---|---|
| AUTHOR | Perraton, Hilary; Creed, Charlotte; Robinson, Bernadette |
| TITLE | Teacher Education Guidelines: Using Open and Distance Learning. Technology, Curriculum, Cost, Evaluation. |
| INSTITUTION | United Nations Educational, Scientific and Cultural Organization, Paris (France). Div. of Higher Education and Research.; International Research Foundation for Open Learning, Cambridge (England). |
| PUB DATE | 2002-03-00 |
| NOTE | 68p. |
| AVAILABLE FROM | UNESCO, Higher Education Division, Teacher Education Section, 7 Place de Fontenoy, 75352 Paris 07 SP, France. Fax: 33-0-1-68-56-26. |
| PUB TYPE | Guides - Non-Classroom (055) -- Reports - Descriptive (141) |
| EDRS PRICE | EDRS Price MF01/PC03 Plus Postage. |
| DESCRIPTORS | Computer Uses in Education; *Distance Education; Educational Finance; Educational Policy; Educational Technology; Elementary Secondary Education; Higher Education; Inservice Teacher Education; *Open Education; *Preservice Teacher Education; Program Evaluation; Teaching Skills |

ABSTRACT

These guidelines are designed to help anyone considering the use of open and distance learning for teachers. They answer eight major questions and identify options available to planners and strategies for choosing them. Eight sections include: (1) "What is Wrong With Teacher Education?" (e.g., what it consists of and who the teachers are); (2) "Is Distance Education Relevant?" (e.g., what distance education is and whether it works); (3) "What Has it Been Used For?" (e.g., why use distance education and how it can help curriculum reform); (4) "How Is It Planned and Managed?" (e.g., what the policy framework is and what models there are for managing it); (5) "What Technologies Can We Use?" (e.g., what choices are available and what they cost); (6) "How Can You Fund It?" (e.g., what the consequences are of each choice and what funds are needed); (7) "How Do Teachers Learn Practical Skills?" (e.g., how and where it can be done); and (8) "How Can You Assess It?" (e.g., how to assess open and distance learning and how to provide for quality control and formative evaluation). (Contains 23 references.) (SM)

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# TEACHER EDUCATION GUIDELINES: USING OPEN AND DISTANCE LEARNING

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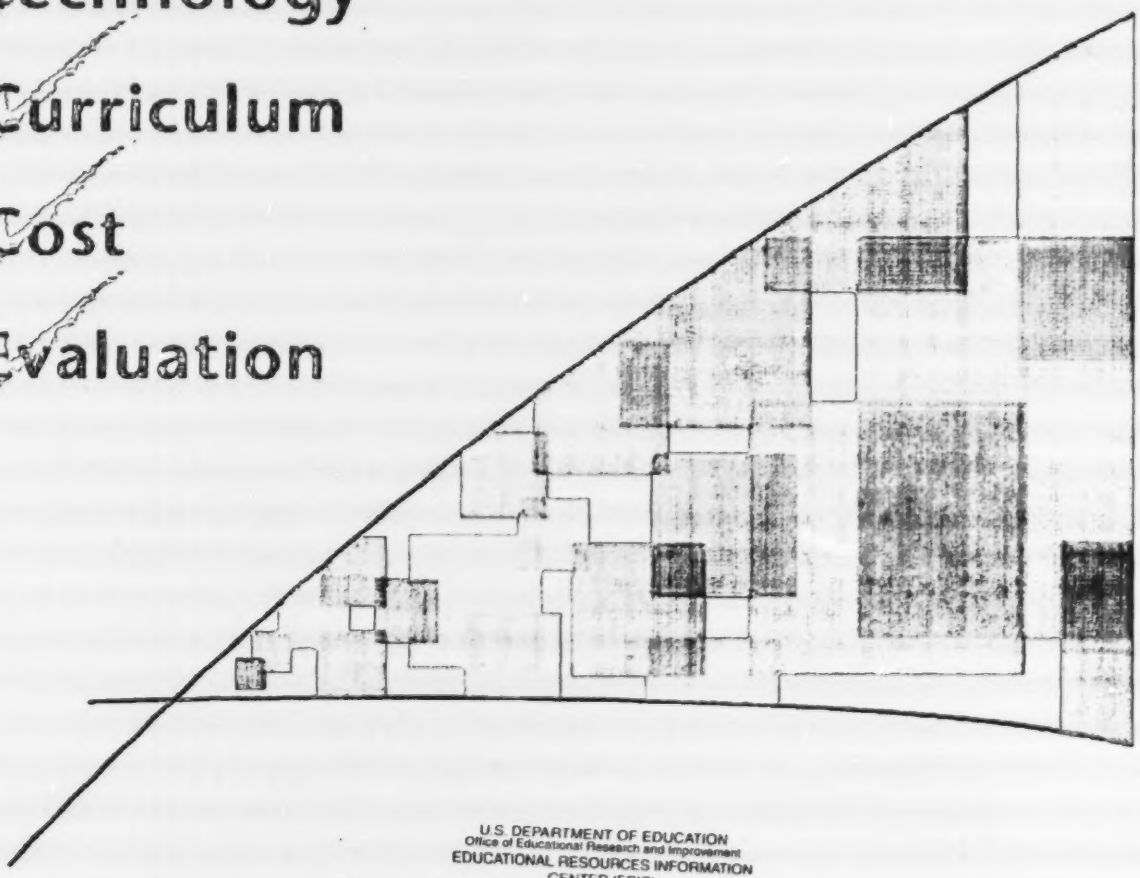

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# *TEACHER EDUCATION GUIDELINES:*

## *USING OPEN AND DISTANCE LEARNING*

*Technology – Curriculum – Cost – Evaluation*

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**UNESCO**

**Education Sector, Higher Education Division, Teacher Education Section**
**in cooperation with E-9 Initiative**

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The Teacher Education Guidelines were designed and produced by the International Research Foundation for Open Learning in Cambridge, under the direction of Hilary Perraton, under contract with UNESCO.

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# PREFACE

The Guidelines set forth in this document are intended for use principally by senior and middle-management education officers in Education Ministries and teacher training institutions who are daily called upon to make hard choices in how to expand teacher education through open and distance learning.

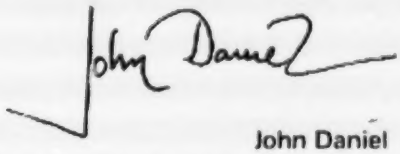
The Guidelines represent a major activity in one of UNESCO's main lines of action for higher education, as summarized in the Organization's Approved Programmes and Budget for 2000-2001 (30 C/5), paragraph 01240. In that paragraph reference is made to the fact that "The General Conference authorizes the Director-General: (a) to implement an inter-sectoral project entitled 'The status of teachers and teacher education in the information society', in order to assist Member States in renewing teaching methods and the training of teachers at all levels, and, using open and distance education approaches, adapting them to the emerging information society, and..."

The guidelines also follow-up the recommendations concerning teacher education using distance learning that were made by the World Conference on Higher Education (WCHE, Paris, October 1998), the World Forum on Education (Dakar, April 2000), and the Seventh Session of the Joint ILO/UNESCO Committee on the Application of the Recommendations concerning the Status of Teachers (Geneva, September 2000).

Many of the national experiences upon which the authors of the Guidelines have drawn are described in a complementary document entitled 'Teacher Education through Distance Learning: Technology, Curriculum, Evaluation, and Cost (UNESCO, Paris, 2001), which summarizes case studies undertaken in Brazil, Burkina Faso, Chile, China, India, Mongolia, Nigeria, South Africa and United Kingdom. Those studies represented an interesting mix of applications of different modes of distance learning. Distance education still remains, at heart, a reflection of individual national infrastructures and a wide complex of educational, social, cultural and economic issues, including the willingness and capacities of teachers themselves to become engaged in these modes in their various learning institutions and communities.

Within UNESCO itself we are glad to have been able to use the studies in order to develop these guidelines on the application of distance learning in teacher education.

We thank the contributors to these studies, which we hope will find wide applicability in Member States.



John Daniel
Assistant Director-General for Education

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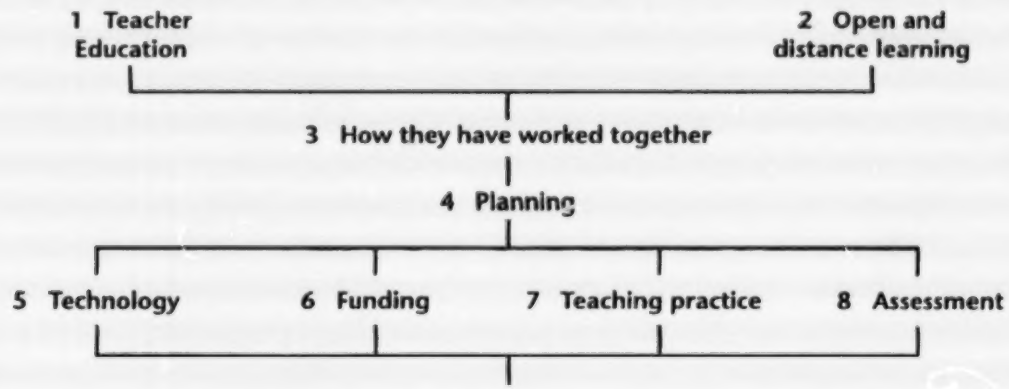
## Introduction: how the guidelines work

These guidelines are designed to help anyone considering the use of open and distance learning for teachers. They try to answer eight major questions – and more minor ones – and in the light of answers to them to identify the options available to planners and strategies for choosing between the options.

We begin with three sets of broad questions for planners: about the problems of teacher education, about the nature of distance education or open and distance learning, and about how the two have been used together. Then we go on to look in detail at questions of planning and organisation, asking what needs to be put in place for an open and distance learning project or programme. This takes us on to four key areas: technology, funding, teaching practice, and assessment. The guidelines end with suggestions of other places to get information and help. Diagrammatically, one route through the guidelines looks like this.




The guidelines are based on recent experience and in particular on a set of eleven case studies, carried out on behalf of UNESCO, which are published separately. It is a pleasure to acknowledge our indebtedness to the authors of those case studies: João Batista Oliveira (Brazil), Jean-François Terret (Burkina Faso), Cristian Cerda (Chile), Miguel Ripoll (Chile), Miriam León (Chile), Wei Yuan Zhang (China), Niu Jian (China), Ghada Gholam (Egypt), Tarek G. Shawki (Egypt), Ram Narain Mehrotra (India), Bernadette Robinson (Mongolia), Rashid Aderinoye (Nigeria), Charles Potter (South Africa), William Fraser (South Africa), Corinne Meier (South Africa) and Rob Walker (United Kingdom).

The guidelines also draw from a map of world experience in the use of open and distance learning for teachers, drawn up for the British Department for International Development under a project that was funded as part of DFID's knowledge and research strategy, 'Researching the issues 2000'. They also reflect international experience reported by other agencies on the use of open and distance learning for teachers. All three activities – the drafting of the guidelines, the management of the case studies and the mapping exercise – were carried out together by the International Research Foundation for Open Learning; the foundation records its gratitude to both agencies for their support and their agreement to use material that appears in another form in those documents. The authors are also indebted to colleagues in UNESCO, at IRFOL and among its associates, and more widely, for comments on the draft. They have a major debt of thanks to Masako Saulière and Ratimir Kvaternik, both working at UNESCO as this work was planned and executed, for their consistently good advice and friendly help as it went forward.



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## 1. What is wrong with teacher education?

Teachers are vital. Unless we can get more teachers, and better teachers, we will not reach the target of making quality education available for all by 2015. But there are still world shortages of teachers, still large numbers of underqualified teachers, and still many who need further professional education and training as they work. Conventional approaches to teacher education have not met all the demands upon the profession and this has led to an interest in open and distance learning alternatives.

In much of the south and especially in sub-Saharan Africa and south Asia, problems of teacher supply, of four kinds, threaten the attainment of the education targets. First, there are shortages of teachers. While school enrolments generally grew in the 1990s, teacher numbers only just kept pace with them; indeed, in six Commonwealth African countries pupil numbers were growing faster than teacher numbers. Meanwhile, AIDS is reducing the life expectancy of teachers and so increasing the numerical demands. With all the other pressures on educational budgets, it seems unlikely that teachers' colleges can be expanded at the rate necessary to meet these demands. Teacher shortages continue to dominate the educational landscape.

Second, in many but not all countries female teachers are in a minority in primary schools. Progress in getting more women into the profession is slow; in Africa the proportion of women rose from 39.4 percent to 43.3 per cent between 1990 and 1997, while in south Asia it rose only from 28.0 to 29.6 per cent.

Third, even where there are enough teachers, too many of them are untrained or undertrained, and the quality of training is often itself inadequate. A number of studies have found little difference between the effectiveness of trained and untrained teachers. 'About half of the teachers in developing countries are unqualified in terms of their own country's formal standards for teachers' education. Many teachers have little more than secondary education themselves. Teaching methods are often old fashioned, with too much focus on rote learning' (DFID 2001: 9).

Fourth, in many countries, there is a national desire not just to raise the quality of the teaching force to match the present demands on them but also to change teachers' jobs as their host societies are changing. New goals create new demands: gender parity by 2005 and universal basic education by 2015; inclusive education; education for democracy, peace and social cohesion; multi-grade teaching; increased accountability for achieving learning targets; the development of learners who are self-managing and independent, skilled in critical thinking and problem solving, equipped with life-skills; the preparation of learners who are competent for knowledge-based economies, capable in the use of information technology; and the expansion of teachers' roles to include social work in communities where child-headed households and orphans are common as a result of HIV-Aids. In transition countries, society is expecting teachers to change their approach as education itself is being reformed, within the context of social change. And these changes in role and changes in expectation are likely to affect both the initial education of teachers and programmes of continuing professional development.

All of this creates new challenges for teacher education and continuing professional development: the need to find ways of using existing resources differently, of expanding access to learning opportunities at affordable cost, of providing alternative pathways to initial teacher training, of drawing on new constituencies of the population to work as teachers, of using technologies appropriately to enrich teaching and support practice, of stimulating and supporting



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teachers' active learning and of reconceptualising the traditional organisation of initial teacher education and continuing professional development.

In order to make good planning decisions about teacher education we need to ask in turn: what does it consist of? who are the teachers? and what is the curriculum?

## 1.1 What does it consist of?

Teacher education has to do a whole range of different jobs: to enable teachers to develop the potential of their pupils; to serve as role models; to help transform education and through it society; to encourage self confidence and creativity. At the same time, many educators often hope that student teachers will develop appropriate, and where necessary changed, attitudes to their job. In order to meet these hopes, teacher education is likely to include four elements: improving the general educational background of the trainee teachers; increasing their knowledge and understanding of the subjects they are to teach; pedagogy and understanding of children and learning; and the development of practical skills and competences.

The balance between these four elements varies in relation to the background education of student teachers, to the level at which they will teach, and to the stage they have reached in their career. Two distinctions are important here. The first is between the initial education and training of teachers and their continuing professional development. The second is between preservice and inservice activities. The two sets of distinctions do not overlap: many teachers begin work without teaching qualifications so that they may get initial training while they are working inservice. Then, inservice programmes may meet a variety of different needs, from initial training to updating or preparing teachers for new roles to helping reform the curriculum. Some of these purposes and distinctions are set out in table 1.1:

**Table 1.1: Purposes of inservice programmes**

| ***Purposes*** | ***subcategories*** |
|---|---|
| Initial training of unqualified teachers | programmes leading to certification<br>short induction courses |
| Upgrading of teachers who already have a qualification | for subqualified teachers<br>for qualified teachers |
| Preparing teachers for new roles | as head teachers<br>to work in teachers' colleges |
| Training related to content of the school curriculum | for planned curriculum change<br>refresher courses |

Source: based on Greenland 1983

The needs of primary education have dominated much discussion about teacher education and open and distance learning has been used more to prepare primary than secondary teachers. But this may be changing: earlier expansion of primary education is creating increased demands for secondary teachers, and in some cases to give primary teachers the skills to work at junior-secondary level. Basic education is increasingly seen as including both primary and at

least the first cycle of secondary education. Meanwhile teachers who move on to new roles, as head teachers or to work in teachers' colleges, often need and seldom get programmes of professional development to help them in their new job. A concern for their professional standing, long recognised by UNESCO as of major importance for the quality of education as well as for the condition of their lives, compels attention to programmes of this kind.

## 1.2 Who are the teachers?

Programmes of both initial teacher education and continuing professional development need to match the needs and circumstances of their audience. One size will not fit all. In particular, in designing a programme for teachers, we need to take account of:

- ***their educational background.*** This varies enormously between different countries and different levels of education. In some countries there are many teachers with little more than junior secondary education while in others all are graduates with a professional qualification as well. The balance between the different elements in teacher education is likely to affect the content of programmes for them.
- ***gender.*** It is difficult to recruit enough women teachers in many countries, enough men teachers in some. Programmes need to fit with the rest of teachers' lives and be sensitive to cultural norms and expectations that affect their jobs. In some countries there are restrictions on women teachers' mobility that affect their ability to attend initial or updating courses.
- ***their experience as teachers.*** Again, the content of a programme for – say – unqualified teachers who have just left school may be very different from one for teachers with limited formal education but long experience as untrained teachers.

The teaching force is scattered so that there are logistical problems to be overcome in providing inservice courses. If they have to travel to a central point, then there are actual costs involved for transport and possibly subsistence and opportunity costs for the time they are out of school. Family and other commitments may limit the ability of teachers to attend courses. There is obvious strength in any approach that can reach teachers without their leaving their schools for long journeys.

## 1.3 What is the curriculum?

The curriculum of teacher education is varied, and contested, is widely criticised, and in many countries is in a state of flux. In different countries emphasis has recently been placed on the importance of education to help countries compete in global markets, on social transformation, on technology, as well as on developing individual capacity. 'In different places we have got economics, social transformation, personal development, religion, technology, ethics, and a shift in the teacher's role, all among the aims of teacher education' (Perraton 2001: 2).

As a result, many education authorities are seeking fundamental changes in the curriculum. There is a widespread view that some emphasis, and resources, should shift from initial to continuing teacher education. At the same time, some authorities are beginning to revisit traditional and indigenous educational institutions in order to learn from their strengths and explore the possibility of integrating their work with a more modern curriculum. Demands on teachers continue to grow and become more diverse and their own education needs to reflect this.

Thus teacher education in many countries gives an impression of rethinking, and restructuring of the curriculum. But it is not clear how far the rhetoric of reform has led to superficial or substantial restructuring. The evidence here suggests the former. A recurrent picture is the coexistence of traditional and newer curriculum models within one programme. This takes the form of two competing strands of thinking that, for convenience, can be labelled as traditional and progressive tendencies. The traditional is teacher-centred, based on behaviourist assumptions, has a transmission view of knowledge and regards the teacher as a technician; the progressive strand includes more active and participatory learning methods, is less authoritarian, places more demands on teachers and contains elements of constructivist thinking. The progressive agenda encourages the development of reflective practice among teachers. As a result, the traditional model of master-apprenticeship, of theory preceding practice, has become increasingly challenged and the coherence between education theory and the actual practice of teaching became an even more critical issue. Key questions then arise for the curriculum planner about the extent to which this agenda is appropriate for teachers who have themselves had only a limited background education. In a classic analysis of the realities of educational reform, Beeby (1966) warned against seeking over-rapid transformation and of the dangers of unrealistic expectations of teachers who were themselves teaching at the limit of their knowledge.

All of these issues affect the curriculum planner, regardless of the methods, timing or location of teacher education. If, then, we are planning to use open and distance learning for teachers we need to ask not only about how it can work – the theme of the rest of these guidelines – but also about curriculum policy. Critical questions are about:

- the balance between the four elements of the curriculum for the particular audience, taking account of teachers' own background education;
- the balance between preservice and inservice education;
- the debates between traditional and progressive approaches and views about the appropriateness of defining teacher education in terms of a set of stated competencies;
- realistic expectations that will help the progress of curriculum reform but can be achieved with the support, interest and goodwill of teachers.

The planner then needs to consider methods that will fit both the aims of the curriculum and the circumstances of the learners. This in turn is likely to mean the use of a variety of different approaches – a theme we pick up in chapter 3.

In the next chapter we look at the nature of open and distance learning, in order to assess how far it can meet these needs for teachers and for the educational service within which they work

## 2. Is distance education relevant?

To establish whether distance education can help with the teachers' demands set out in chapter 1 we need to ask what it is, whether it is legitimate, whether it works, and how much it costs.

### 2.1 What is distance education?

The language is confusing. 'Distance education' is sometimes taken to mean the use of television and at others the use of the internet. The words imply that students are always remote and never meet each other or their teachers. 'Open learning' suggests that anyone can enrol and start and finish when they like. 'New information technologies' sounds good but vague. These guidelines are about the use of a range of technologies in education, using a set of definitions that have general currency. Distance education has been defined as an educational process in which a significant proportion of the teaching is conducted by someone removed in space and/or time from the learner. Open learning, in turn, is an organised educational activity, based on the use of teaching materials, in which constraints on study are minimised in terms either of access, or of time and place, pace, method of study, or any combination of these. The term 'open and distance learning' is used as an umbrella term to cover educational approaches of this kind that reach teachers in their schools, provide learning resources for them, or enable them to qualify without attending college in person, or open up new opportunities for keeping up to date no matter where or when they want to study.

Open and distance learning often makes use of several different media. Students may learn through print, broadcasts, the internet and through occasional meetings with tutors and with other students.

Three illustrations take us beyond definitions.

The University of the South Pacific serves scattered audiences over the huge area it serves. It teaches education, and other disciplines, by combining correspondence lessons with broadcasts and with regular sessions at regional centres within its region. The university was one of the earliest users of communication satellites and is able to run two-way seminars with its students by means of satellite links. The university's early adoption of distance education has made good quality teacher education available that would have been beyond the resources of the individual small states of the Pacific.

In order to expand the supply of teachers as it came out of a period of civil war, Uganda has set up a number of programmes deigned to equip untrained and unqualified teachers with professional skills. It has done this by combining teaching mainly through print with regular face-to-face sessions for student teachers and short periods of intensive study within conventional teachers' colleges.

The British Open University was set up in 1969 to widen access to education in Britain and has served as a model to many others. At the request of government it introduced a programme for a certificate in education for graduates who wanted to enter teaching but had no professional qualification. Teaching materials were distributed partly by mail and partly through the internet. Trainee teachers were based in schools where a mentor guided their teaching practice. Students used computer conferencing as an integral part of the course to interact with tutors and with each other.



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Open and distance learning may use print, broadcasts, cassette recordings, computer-based materials, computer interaction, videoconferencing, and face-to-face learning. We look at the choice of technologies in chapter 5. The essence of it is that it enables students to learn without attending an institution. That has made it attractive for students who, for practical, economic, social and geographical reasons cannot get to college. It also makes it particularly appropriate for audiences that are scattered, and audiences that cannot leave their jobs to attend full-time courses. The world's sixty million teachers are like that.

## 2.2 Is it legitimate?

Open and distance learning is often seen as barely legitimate. Its history is marked by the work of institutions that accepted student fees, gave them poor service, and kept their costs down by encouraging students to drop out once they had paid all their money. Learning at a distance, particularly from printed materials, lends itself to rote learning. If teaching material gives all the answers then there is no room for an individual response while if it fails to do so the student may feel challenged but frustrated. Distance learning can be a soulless and isolated activity so that dropping out is more attractive than going on. Most parents and probably most educational planners would encourage their own children to study at a conventional university rather than an open university. Few would argue that open and distance learning matches the best of conventional education as sometimes practised in rich universities in industrialised countries or in a golden age we think our grandparents might have been able to remember.

But there is a threefold case to be made for its legitimacy. First, the evidence of public-sector open universities, and dual-mode universities that teach both conventionally and at a distance, is that students can achieve examination results that match those of conventional universities. A significant proportion of students give up along the way and do not complete their courses. But this is true of all students working part-time and not a distinguishing mark of students learning at a distance.

Second, distance education has been powerfully effective in reaching audiences who could not meet their educational needs from conventional institutions. In Colombia, a radio-based school was, in the 1970s, reaching over 100,000 rural peasant students every year. The National Technological University in the United States is using satellite and broadcasting technology to meet the needs of engineers for postgraduate study without their having to leave their jobs and attend a campus. In China, the combined use of television, classroom sessions, and printed materials is providing university education to about a third of all the students in higher education. A church-based nongovernment organisation, the American private sector, and the government authorities in China have all perceived distance education as legitimate because of its power to widen access to education.

Third, where open and distance learning provides opportunities for student interaction with tutors, it allows open-ended dialogue, often regarded as the touchstone of legitimate education. Thus, while open and distance learning may lend itself to rote learning - as does learning in large classrooms - this is not an essential or defining characteristic.

The arguments are linked: open and distance learning is legitimate because it has a record of success in terms of the measures applied to conventional education, but would be of little interest if it simply replicated for the same audience what could be done conventionally, and of little value if it got people through their examinations at the expense of more serious educational purposes.

## 2.3 Does it work?

The first part of that answer about legitimacy suggested that open and distance learning could work. But does it actually work for teachers? We can look at three kinds of answers - about student numbers, about outcomes in terms of examination results or learning gains, and about performance in the classroom.

The evidence on numbers enrolling on courses is solid and reassuring. Many programmes of teacher education, in all continents, have succeeded in enrolling students in significant numbers. We need, however, to go on to ask also about completion rates. Where teachers have been promised improved status or pay at the end of the course, completion numbers can be as impressive as enrolment numbers. In its programme to expand the teaching service in the 1970s, for example Tanzania succeeded in recruiting 45,000 potential teachers of whom 38,000 went on to get their qualifications (Chale 1993: 31). In the case studies recently completed by UNESCO, completion rates varied widely. (The case studies are outlined in chapter 3, below). In Burkina Faso, very few headteachers dropped out. In the case of Nigeria, drop-out rates varied from 27-39 per cent and the pass rates of those completing the programme varied from 55 per cent to 64 per cent. In the British Open University, completion rates appeared to be relatively high. In contrast, a programme in India had a completion rate of less than 20 per cent while about half the teachers learning about new communications technologies in Chile did not complete the course, partly because of difficulty in paying their fees. In both of these cases, in contrast with the Tanzanian example, students enrolled individually rather than being recruited in a national campaign and were not guaranteed promotion or a new status on completion.

There is evidence, too, that students on courses for teachers get reasonable examination results. A review of nine earlier case studies found that pass rates were between 50 and 90 per cent, figures that are probably in line with more recent data. It concluded that 'while examination success cannot be equated with teaching capacity, we can legitimately assume that a reasonable examination pass rate demonstrates that a programme was effective in teaching academic subjects' (Perraton 1993: 393). Rather than look at examination results, we might want to examine how well trainee teachers learned. Teacher education projects in Indonesia and Sri Lanka set out to measure learning gains and found reasonable evidence of effectiveness that is in line with the evidence on examination results (Nielsen and Tatto 1993).

It would also be interesting to ask whether the students of trained teachers performed better than those of untrained but unfortunately we have limited evidence, and hardly any of it from open and distance learning. A series of studies have yielded the disturbing results, from developing-country studies, that there was little difference in school outcomes with qualified or unqualified teachers (cf. Perraton 2000: 59-60, Avalos 1991, Torres 1996). One interpretation of this is that poorly qualified teachers are not much more effective than poor unqualified teachers and that there is therefore a case for improving - and spending more on - teacher education. Rich-country evidence bears this out. A recent study from the United States which compared student achievement and teacher policies within its states 'demonstrates that the states leading the nation in student achievement and those that have made the most significant gains in achievement are the states that have the most highly qualified teachers and that have made consistent investments in teachers' professional development' (Russell and McPherson 2001: 8). Better educated teachers probably teach better.

Only a handful of studies have followed trainee teachers into the classroom to see how well they are performing. This was, however, the subject of evaluations of distance-education programmes for teachers in Tanzania and Zimbabwe (Chale 1993, Chivore 1993, Mählck and Temu 1989). Evidence from these large-scale projects to expand teacher supply was reassuring: while direct comparison between students taught in

**Table 2.1: Outcomes of some projects**

| *Project, date, purpose* | *Numbers* | *Outcomes* | *Costs* |
|---|---|---|---|
| Inservice upgrading of unqualified primary school teachers, Botswana, Swaziland, Uganda 1967-78 | Each in range 600 to 1,000 | Successful completion rate 88-93%. Anecdotal evidence of impact on classroom performance. | n/a |
| Kenya programme for unqualified primary school teachers, to improve general educational background and achieve secondary examination passes 1967-73 | 8,433 over 7 years; annual enrolment 850 to 2,000 | 91% passed examination and gained promotion. No firm evidence on classroom performance. | Cost per enrolment relatively high in comparison with alternatives |
| Tanzania programme to recruit and train on the job primary school teachers for introduction of Universal Primary Education 1976-84 | 45,534 in three annual cohorts | 83% qualified. Positive evidence on classroom performance. Weaknesses in science teaching and self-confidence among female teachers | Cost per successful trainee about half cost of residential course |
| Zimbabwe Integrated Teacher Education (ZINTEC) for secondary school leavers, trained on the job for expansion of primary schooling 1981-8 | 7,353 over four years | 80% pass rate. Positive evidence of classroom performance but difficult to draw comparative conclusions | n/a |
| Nigeria National Teachers' Institute training primary school teachers TCII course after 2 years secondary education 1984-90 NCE course after 5 years 1990- | 186,713 over period Enrolment of 14,909 on 1st cycle and 26,657 on 2nd cycle | Success rate thought to be in range 25 to 30% of those entering; compares favourably with alternative; no evidence on classroom practice 21 000 students graduated 1994 | Cost probably lower than conventional college |
| Pakistan Primary Teachers' Orientation Course (Allama Iqbal Open University) introducing new curriculum to primary school teachers 1976-86 | 83,658 total | 56% completed course; 38% of original enrolment passed examination Positive self-report on usefulness. No direct evidence of classroom effects | AIOU graduate costs 45-70% of conventional university costs |
| Indonesia Universitas Terbuka upgrading course for lower secondary teachers | c 5,000 | Positive effects on subject mastery and in theory and practice in skills; relatively poor results in mathematics; apparent decline in attitudes towards teaching | Cost about 60% of equivalent |
| Sri Lanka National Institute of Education training primary-school teachers with secondary level qualifications | c 5,000 | Positive effects on subject matter and in theory and practice in skills; less successful than conventional college in mathematics | Cost one-sixth to one third of alternative |
| Uganda Northern Integrated Teacher Education Project for primary school teachers 1993-95 | 3,128 enrolled | 88% completed and passed examination; some evidence of improved skills in teaching competencies | Cost per student about $2,000 compared with $2,500 in conventional college |

Source: Perraton 2000: 80 - 1



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different ways was problematic students' classroom practice stood up comparatively well (Perraton 1993: 394-5).

The available data are thin, partly for lack of good research, but for what they are worth are summarised in table 2.1.

## 2.4 What does it cost?

There are three kinds of answer to this question. First, we can look at broad-brush comparisons between the actual costs of training cohorts of teachers through contrasting approaches. Second, we can look at the costs of different technologies: we come back to this in chapter 5. Third, we can analyse the kinds of expenditure needed for teacher education in varying circumstances. We look at this below.

Using the first approach, a number of broad-based comparisons have been made between conventional and distance-education approaches in terms of the cost per student or cost per successful student. Of course these comparisons are crude, and lump together very different kinds of distance-education programme. But, for what it is worth, the evidence suggests that, above a threshold in numbers,

> with the relatively high completion rates often achieved in teacher education, costs per successful student tend to compare favourably with those of conventional education. This differential holds true both for projects with quite modest costs per student, reflecting limited student support, as in Pakistan [at the Allama Iqbal Open University Primary Teachers Orientation Course], and those with relatively high costs incurred for extensive student support and supervision of classroom practice, as in Tanzania [in its large teacher education programme of 1976-84].
>
> Perraton 2000: 128

The figures are summarised in table 2.2.

Interpretation of the figures takes us into the detail examined below in table 5.2 and 5.3 and to the third approach suggested above. We need to look at the differences in behaviour of the costs of conventional and distance approaches to teacher education. Open and distance learning is often characterised as having high fixed and low variable costs which therefore allow for economies of scale: with more students the unit costs go down. The large teacher-education programmes in China, or the early programme in Tanzania, demonstrate this. In considering teacher education, however, other factors are often as important in determining comparative costs. If trainee teachers study part-time, with reduced periods of residence at a college then there are likely to be savings in the cost of residence and governments are less likely to pay an allowance while they are studying. Furthermore, if trainees are teaching, either full or part-time, while they study, cost analysis needs to take account of the value of this work. (Total expenditure is lower if, say, untrained teachers study at a distance than if they are taken out of the schools to attend a full-time course and a new cohort of teachers is put into the schools.) Costing needs to take account of arrangements for student support and, often critical, of arrangements for classroom teaching and its supervision (see chapter 7). To examine the total set of differences between the two approaches we need therefore to examine:

**Table 2.2: Costs and effects of some teacher education projects**

Currency: constant 1998 US$

| *Country, project, date* | *Student numbers* | *Average cost* | *Educational and cost impact* |
|---|---|---|---|
| Tanzania TTD 1979-84 | 15,000 p.a.<br>45,000 total | 1863 per student p.a.<br>7316 per graduate | Effects comparable to conventional education. Cost about half conventional education |
| Brazil Logos II 1976-81 | 24,400 | 211 per student p.a.<br>741 per graduate | 80% pass rate.<br>Costs lower than alternative |
| Sri Lanka 1984-8 | c5000 | 116 per student p.a. | Cost 1/6 – 1/3 of alternative. More effective than alternative for some subjects but less effective for others |
| Indonesia 1985-8 | c5000 | 805 per student p.a. | Cost about 60% of equivalent. More effective than alternative in languages but less in maths |
| Nepal RETT Basic teacher course 1978-80 | 3000 | 196 per student p.a. | Cost slightly lower than alternative; completion rate 83%, pass rate 57% |
| Nigeria National Teachers Institute 1978-89 | 20,327 | 79 per student p.a. | Cost probably lower than regular colleges; completion rate estimated 42%, pass rate estimated 27%, both rates higher than at regular colleges |
| Pakistan Primary Teacher Orientation Course 1976-86 | 83,658 enrolled<br>31,674 completed | 107-149 per successful completer | Cost per AIOU graduate 45-70% of conventional university |
| Kenya inservice teacher training 1968-77 | 790 | 806 per subject equivalent p.a. | Cost relatively high; favourable effect on access |
| Kenya University of Nairobi BEd 1986-90 | 515 | 1096 per student p.a. | Cost thought to be lower than cost of residential equivalent |
| Nigeria COSIT University of Lagos 1980-8 | 2000 | 345 per full-time student equivalent.<br>1304 per graduate | If opportunity costs are omitted then cost per graduate slightly lower than residential campus cost |
| Uganda NITEP project 1993-7 | 2750 | 2000 per successful student | Lower cost than equivalent |

Source: Perraton and Creed 2000

- the scale of the programmes;
- the media or technologies used (see chapter 5);
- the costs of face-to-face or residential study;
- the cost of other student support;
- the costs of teaching practice and of supervising or examining it; (see chapter 7)
- policy on charging fees (see chapter 6);
- the opportunity costs of taking teachers out of school for their own education.

Some of the differences between the two approaches are set out in table 2.3.



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**Table 2.3: Comparison between the costs of conventional and distance education for teachers**

| | *Conventional* | *odl* |
|---|---|---|
| **EXPENDITURE** | | |
| Residence | Likely to be a significant proportion of total costs | Cost likely to be reduced where students are in residence for smaller part of total study time |
| Grants, allowances | Often paid to full-time students | May be paid only for short periods of residence |
| Staffing | Staff time dominated by face-to-face teaching | Proportion of staff time required for materials development and for tutoring at a distance |
| Materials, media, communication | | Costs likely to be higher and influenced by sophistication of media chosen; economies of scale are possible |
| Student support | Level of expenditure determined by amount of field supervision provided | Significant expenditure often needed for isolated students and to supervise classroom work |
| Annualised capital | Cost of teachers colleges and facilities likely to be a major capital item | Some capital required for distance education activities but these are counterbalanced by reductions in costs of college accommodation |
| **OPPORTUNITY COSTS** | | |
| For students | Students may forgo notional income by attending college | Teachers may forgo income from private tuition while studying |
| For ministry of education | | If students teach while they study ministries avoid costs of funding their replacements |
| **INCOME** | | |
| Student fees | Rarely charged | Are sometimes charged, especially where students are voluntarily upgrading their qualifications |

## 2.5 Conclusion

The evidence shows that distance education, in its various forms, can work and if well-designed can be educationally legitimate. It has been applied to the education of teachers and has been shown to be effective on a number of measures. In terms of cost per student, distance-education programmes have often shown advantages over conventional programmes. With this kind of reassurance we go on, in chapter 3, to look at the particular roles it has played in teacher education.



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## 3. What has it been used for?

Distance education been used to teach, support and develop teachers for many years: UNESCO was a pioneer through its UNRWA/UNESCO Institute of Education which was training teachers for refugees forty years ago. Since then open and distance learning has been used in many countries of the world with a reasonable record of success. The use of new information and communication technologies has drawn new attention to open and distance learning and offers new possibilities. We begin by asking why it has been attractive to decision makers.

### 3.1 Why use distance education?

The reasons are varied. It has been used to reach trainees in geographically challenging areas such as the riverain regions in Guyana, mountainous areas in Nepal, the dispersed communities of the Indonesian archipelago and the small island states in the Caribbean and Pacific. In some high population countries such as China and Pakistan, distance programmes have played an essential role in providing teacher education on a huge scale. In many Latin America countries distance education has been used widely to support curriculum reform and teacher upgrading. Teacher education by distance is being used to redress inequalities in teaching qualifications in post-colonial Namibia and Zimbabwe and in South Africa, as a tool for reconstruction of the teaching service in Uganda. In other countries, it is being used to reach marginalised communities such as refugees in Sudan, itinerant communities in Mongolia, and minority-groups in northern Pakistan.

Using distance education for teacher training has various potential advantages. Large programmes have brought economies of scale. In contrast to college-based training, distance programmes can provide access to courses on a much larger scale and wider geographical reach. It can overcome regional differences in access to teacher education. It provides a means of side-stepping the slowness and dilution of the cascade approach. In continuing professional development, distance education can help avoid the cost of replacing a teacher who has gone to full-time education. It can open up access to teacher-training opportunities for teachers with family responsibilities who are earning an income and need to remain within their communities. The establishment of a decentralised distance-education structure can also be used to support training in the districts and serve as a basis for the development of a programme for the continuing development of teachers. In print-poor countries, self-study materials can become a permanent resource. It can also 'put information about curricula and teaching approaches directly in to the hands of individual teachers' (Robinson 1997: 125) and cut down the time between learning about new teaching practices and trying them out in the classroom. This is particularly important in curriculum reform and short professional development courses. Carefully balanced mixed-mode teaching can help to double and triple a college's training output per year. Where the infrastructure for them is in place, new information and communication technologies have opened up a range of new opportunities for course- and resource-based learning in teacher education.



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Three general points need to be stressed. First, distance education is of potential benefit to teachers because it can reach scattered populations and can offer them education and training without their having to leave their schools. Its has great logistical advantages. This means that it offers the chance of accelerating the supply, or the updating of teachers, beyond what could be done through conventional means.

Second, good programmes of open and distance learning have benefited from its strengths and avoided its weaknesses. Some aspects of teacher education need to be done face-to-face, or need close interaction with a tutor or with other students. Others do not. Programmes that combine conventional and distance methods are likely to be better than those that rely on a single approach.

Third, and for that reason, the more successful programmes have been carefully integrated into the structure of teacher education as a whole. They have not been designed as second-class alternatives to conventional education but as a part of a complementary system using a variety of different approaches, each chosen for its appropriateness to the curriculum and the audience.

## 3.2 Which parts of the curriculum is it good for?

We can go on to ask whether there are parts of the curriculum of teacher education for which open and distance learning is more or less appropriate. In chapter 1 we distinguished between four elements of the teacher's curriculum: general education, subject knowledge, pedagogy, and practical teaching. All of those elements have been addressed in different programmes of distance education, using a variety of technologies, which are examined in more detail in chapter 5. Distance education would seem to lend itself to the first element; there is wide experience of using open and distance learning methods for the traditional curriculum of secondary or tertiary education and a wealth of experience in offering an effective equivalent curriculum of this kind. In many countries there are teachers, or student teachers, with quite limited background education. Often these are the older and more remote teachers for whom open and distance learning may be a more convenient method of study than conventional education. Using open and distance learning to raise the level of their general education may be a simple and effective means of raising the quality of the teaching force.

Extending teachers' knowledge of the subjects they are to teach may be more demanding if it is asking teachers both to acquire new subject knowledge and at the same time to think about how they are to present it in the classroom. In Guyana, for example, a teacher training project dealt with this by running initial, pre-training programmes designed to increases the academic competence of unqualified primary and junior secondary teachers in English, mathematics and science in order to get them to the level needed for entry to a conventional teachers' college Educators have also used distance-education approaches to bring new thinking and teaching practice about specific subjects of the curriculum. In Latin America regional collaborative projects have been set up in environmental education, mathematics and science. Some aspects of pedagogy or of child development lend themselves well to open and distance learning. Video examples of real-life classroom teaching in a variety of contexts can give teachers a wider range of exemplary approaches than would be possible in conventional face-to-face learning. Similarly the A-Plus television series in Brazil gives teachers regular access to examples of classroom teaching together with the voices of teachers talking about their experience and concerns.

As we saw, many programmes - properly - include elements of teaching practice and here it is generally necessary to combine what is done at a distance with arrangements for the supervision of classroom practice, the theme of chapter 7 of the guidelines.

The general conclusion is that there are aspects of teacher education where the distant elements of open and distance learning are particularly appropriate, others that demand close contact with tutors or other students. We come back to the implications of this for planning and management in chapter 4.

## 3.3 How has open and distance learning been used?

In chapter one we drew distinctions between programmes of initial education or training and those of continuing professional development, and between programmes for experienced and for inexperienced teachers. Initial teacher education and training is the programme of studies which leads to qualified teacher status according to the official standards of a country. It is the basic or first level of qualification for a teacher. It may be taken as a pre-service programme (before a trainee teacher begins work as a teacher) or an in-service one (while an untrained teacher is working as a teacher). Continuing professional development enables teachers to extend existing knowledge and skills and develop new ones. Some of this takes the form of long structured courses leading to formal qualifications (diplomas or bachelor's or master's degrees). Other forms are shorter, concentrate on skills in managing children's learning or curriculum change and do not lead to additional qualifications. In some countries, qualified and unqualified teachers alike participate in continuing professional development. It may be provided as in-service activities (on-the-job learning) or out-of-school courses of varying length (off-the-job or in vacations).

In order to document recent international experience, UNESCO carried out a set of case studies on teacher education at a distance in 2001. The case studies fell into four groups which reflect differing uses of open and distance learning. They are summarised in table 3.1, which distinguishes programmes for initial teacher education, for continuing professional development, to reorient teachers for curriculum reform and to support career development. Their main features are then described in box 3.1 while a fuller account of them is available in the companion book to this one *Teacher education through distance learning: technology, curriculum, cost, evaluation* (Perraton, Robinson and Creed 2001).

### Box 3.1 Case studies of teacher education at a distance

#### Initial qualifications

***Nigeria:*** *The National Teachers' Institute.* The National Certificate in Education (NCE) is a print-based distance programme offered by the National Teachers Institute in Nigeria, a unique distance-teaching teacher's college. It provides an alternative but equivalent route to minimum national initial teaching qualifications for working primary teachers in a country very short of qualified teachers and where conventional college output cannot meet demand. It aims to provide large-scale training in a high population country at affordable costs.

***United Kingdom:*** *Open University.* The Open University's PGCE programme uses ICT and distance education to support the school-based training of graduates in the United Kingdom. It reflects UK government policy to increase the role of school experience and the use of competency-based approaches in the initial preparation of teachers.

***China:*** *The China Television Teachers College.* The China Television Teachers College (CTVTC), a part of the China Central Radio and Television University (CCRTVU) since 1994, provides large-scale teacher education through a national distance teaching institution. Distance education is included in China's strategic planning for teacher education and plays a significant role in initial teacher education and continuing professional development. Its aim is to provide large-scale teacher training at an affordable cost and to provide a unified system of teacher training.

### Continuing professional development

***Brazil:*** *TV-FUTURA.* A-Plus is a daily non-formal television series designed to stimulate interest in education, teaching and learning among teachers and other educators in the broader community. Taking a journalistic approach, it uses a private educational television channel to reach an audience of 13 million across Brazil. It also helps mobilise teachers into follow-up action through its Community Mobilisation Networks. These extension activities aim to help teachers extend teaching practices in ways that include community involvement, participation and development.

***India:*** *Indira Gandhi National Open University.* The Certificate in Child Guidance is a print-based distance programme for primary teachers, parents and social workers, provided by the Indira Gandhi National Open University (IGNOU) in India. Using printed text, audio and video materials it provides a practically oriented, non-specialist programme which is not otherwise available. The numbers of students have been relatively small (less than a thousand per year).

***Egypt:*** *Cairo University and Ministry of Education.* Egypt has set up a national network of 39 distance-training centres in all governorates and, by using interactive TV technology, has provided scheduled short in-service courses training for teachers and also for educational inspectors, directors and leaders. Trainees in the centres are able to watch subject-specialist presenters in real-time and have the opportunity of putting questions to them via centre coordinators.

***South Africa:*** *University of South Africa (UNISA).* The BPrimEd and BSecEd are print-based degree programmes in teacher education provided by the University of South Africa (UNISA), one of the world's largest distance teaching universities. Distance education plays a prominent role in teacher education in South Africa – more than a third of its primary and secondary teachers were involved in distance education in 1995. These programmes began as in-service ones for working teachers wanting to upgrade to degree level but later diversified to include a pre-service target group too, in response to government policy change.

### Re-orientation of teachers for curriculum reform and change

***South Africa:*** *Open Learning Systems Educational Trust (OLSET).* English in Action is a South African interactive radio programme, run by an ngo, with two audiences: primary school children and their teachers. Through a well-structured curriculum and active learning approaches, the children learn English while the teachers improve both their English and their teaching of it. This non-formal programme asks teachers, many of whom have low levels of English or poor teaching methods, to lead language development activities, such as games or pairwork and to mediate content, if necessary in the mother tongue.

***Mongolia:*** *UNICEF and the Ministry of Science, Education and Culture.* An inservice programme for primary teachers in a transitional country with reduced resources for education and to support changes in curriculum content and teaching methods. Though new to the country, distance education was chosen as an affordable means of reaching more teachers more quickly more often than traditional provision, to re-orient them to new teaching approaches and curricula.

***Chile:*** *Universidad de La Frontera.* This in-service programme aims to teach teachers to learn to use information and communications technology (ICT) in their teaching. It uses ICT to teach teachers to use ICT. Distance education, though fairly new to Chile, was chosen in order to extend the geographical reach of the programme, otherwise available in a conventional face-to-face form, and to meet the teachers' needs for new skills and knowledge created by the recent widespread provision of computers to schools.

### Career development

***Burkina Faso:*** *Ministry of Basic Education and Literacy and RESAFAD (the African Network for Education at a Distance).* This was part of a multi-national programme for West African francophone countries aimed at increasing the management capacity of headteachers. The programme benefited from the use of new information and communication technologies to help the process of course development but used print, coupled with meetings of headteachers, to reach its scattered audience. The programme reached about a quarter of Burkina Faso's headteachers and there is some evidence from reports of school inspectors of more efficient school management as a consequence of the course.

These categories inevitably overlap: career development may, for example, be regarded as part of continuing professional development; some of the programmes have more than one audience, and may include qualified and unqualified teachers, teachers studying for initial qualifications and those using the same programmes to upgrade their qualifications. In general, distance-education programmes have been developed with varied intentions: of widening access to teaching qualifications; of disseminating good practice; of strengthening the education system as a whole by reaching not only teachers but the wider community; in enabling school-based training and professional development and as a means of strengthening the links between theory and practice, focusing on the school as a site of teachers' learning.

We look at each category of teacher education in turn.

**Table 3.1: The case studies**

| *Category* | *Cases* | *Technologies* |
|---|---|---|
| **Initial qualifications** | An alternative route to primary teacher qualifications, Nigeria | Print with face-to-face meetings. |
| Programmes leading to qualified teacher status. | Using ICT to support school-based initial teacher education, United Kingdom | Print, computer communications, face-to-face meetings, video and audio, written feedback on assignments. |
| | Reaching teachers through television, China | Television and video copies, some print, audio-cassettes, face-to-face classes or meetings. |
| **Continuing professional development** | Television-plus: journalism in the service of teacher development, Brazil | Television and video copies, magazines, newsletters, telephone 'call-in' centre, face-to-face meetings. |
| Programmes and activities extending teachers' knowledge, skills and expertise throughout a teacher's working life. | New routes to teacher education degrees, South Africa | Print with some face-to-face meetings, audio- and video-cassettes and some small optional element of computer communications |
| | Developing primary teachers' knowledge and skills in child guidance, India | Print, face-to-face meetings and some audio- and video-cassettes. |
| **Re-orientation of teachers for curriculum reform and change** | Interactive radio for supporting teachers of English a second language, South Africa | Radio programmes, audio-cassette copies, print and some face-to-face meetings. |
| | Re-orienting primary teachers to new teaching approaches, Mongolia | Print and audio (radio and audio-cassettes), some videos and face-to-face meetings. |
| Supporting teachers in changing what they teach and how they teach it. | Teachers learning to use information technology, Chile | Computer communications for an online programme, for delivering materials, supporting interaction, providing access to databases and submitting coursework. |
| **Teachers' career development** | Professional development of headteachers in Burkina Faso | Print and face-to-face meetings. |
| Programmes to extend the careers of qualified teachers. | | |

## 3.4 How has it worked for initial qualifications?

First, some countries have used distance education to provide a route to initial qualifications for significant numbers of teachers, both new entrants to teaching and experienced unqualified teachers. The China Television Teachers College and the National Teachers' Institute in Nigeria

have long experience of this approach and both have become recognised and institutionalised parts of the regular education system in their countries. In a programme that reflects an official policy shift towards more school-based training, the Open University in Britain has run a school-based qualifying programme for graduates who want to enter teaching but have had no professional teacher training.

These three examples from very different countries illustrate differing roles for open and distance learning in initial teacher education. The programmes in China and Nigeria take in large numbers of entrants and make a substantial numerical contribution to increasing qualified teacher supply. The Open University programme makes an important contribution towards providing alternative opportunities for trainee teachers but, in comparison to the Nigerian and Chinese cases, its numerical impact on British teacher supply is modest. The 1998 figures reveal an intake of 1933 trainee teachers compared with a national annual intake of new teachers of some 30,000. However, there is some evidence that twice as many teachers who study at a distance through the Open University course stay in the profession as the national average where up to 40 per cent of newly trained teachers in England leave teaching within three years of qualifying (Personal communication). This finding is consistent with data from teachers working in very different circumstances in Zimbabwe where over 90 per cent of teachers trained through the ZINTEC distance-education programme were reported to be still working in the schools six years after the programme ended (Perraton 2000: 67).

The three programmes provide initial training for different levels of learners, from secondary-level entry qualifications in China and Nigeria to graduate entry in the United Kingdom. The programmes also handle the management of teaching practice in different ways, reflecting the regulations and norms of the different countries and the importance placed on it within different teacher education systems. While the whole programme from the Open University is designed round school experience, in China this is given little emphasis. In the British programme, contact with students on teaching practice in schools and a reduction of their isolation – a problem area in all initial teacher education programmes – is facilitated by the employment of information and communication technologies. The labour-intensive nature of the management of school practice, together with the use of new technologies and of several other media in combination, is likely to increase the quality of teacher preparation but also to increase costs.

## 3.5 What is its role in continuing professional development?

Initial teacher education is no longer seen as enough. Distance education is therefore also being used to raise the skills, deepen the understanding and extend the knowledge of teachers. Some programmes are broadly focused while others are targeted at specialist groups. Programmes are taken either by individuals or by groups of teachers who are encouraged to participate by their schools or their employers. For example, a non-profit television station is taking the lead on supporting school groups in Brazil. In other cases, programmes are available for individual teachers who want to improve their skills and their status, often enrolling on an individual basis, and at their own expense. Indira Gandhi National Open University in India has a number of programmes of this kind. The University of South Africa also offers programmes on this basis. Their BEd programmes are for experienced underqualified teachers and also new entrants to teaching, which serve to meet individual goals as well as contributing to the policy goal of a graduate teaching force. Some programmes are aimed at the upgrading of teachers' qualifications required by official policy on new national standards, as in China for example.

In these and other examples planners have chosen to use open and distance learning techniques to meet the needs of their scattered audiences. In doing so they have been able to take practical moves to provide long-term benefits, in terms of their capacity and status, to individual teachers as well as the education systems within which they work. In both England and Pakistan, for example, ministries of education have called on national open universities to distribute information and training on new curricula, rather than attempt to bring teachers together for this purpose. Some programmes using mass media have also sought to widen the audience beyond the core target of teachers to the broader community. The A-Plus television programme in Brazil uses mass media on a large scale to reach a wide community of viewers while at the same time using the series as a launching pad for further activities by groups of teachers.

## 3.6 How can it help curriculum reform?

Distance education can have a role in programmes of curriculum reform which aim to change either the content or the process of education. In South Africa, the Open Learning Systems Educational Trust is using radio to improve the teaching of English, and to support teachers in this work. In Mongolia, radio and print are used across large distances to re-orient teachers to official changes in curriculum and teaching methods within a country in transition. In response to policy initiatives aimed at establishing the use of information and communication technologies in schools, the Universidad de la Frontera in Chile is using the technologies to support teachers who are teaching these subjects.

The Universidad de la Frontera programme, supporting the teachers involved in the Enlaces project which introduced information and communication technologies to schools in Chile, provided an online programme for teachers, as an alternative option to face-to-face programmes and ensured that the course assignments were of an applied nature. Though the cost of the two alternatives (face-to-face and online) were about the same, the online programme appeared to achieve more change, in fostering more familiarity with the technologies and the development of a 'network communication culture' missing from the face-to-face version. The OLSET programme in South Africa has been effective in reaching large numbers of teachers not only with prescription and advice on how to teach English as a second language but with well-designed lessons, provision of models, guidance in using the radio or audio-cassette resources and support for changes in teaching methods. There is some evidence that not only has the programme reached large numbers at low cost, it has been effective in helping young pupils to improve their English and teachers improve their teaching as well as their English. Using radio in a different kind of way, as a topical magazine and involving teachers in topic identification and programme construction, primary teachers in Mongolia became familiar with new ideas about child-centred teaching and other new approaches and were able to apply them to their teaching.

## 3.7 Can it support teachers' career development?

Distance education has been used for teachers' career development. As they seek promotion, or aim for the next qualification level, or aspire to become a headteacher, or work in a teachers' college, or become an inspector, teachers need to acquire new skills. A multinational distance-education project in West Africa has developed a training programme in school management for headteachers and aspiring heads. In Burkina Faso, over a quarter of the country's

headteachers (whose professional development is increasingly seen as a key element in school effectiveness) developed new knowledge and skills within four years. This served at least three functions: it furthered their careers, built capacity in the headteacher cohort and provided professional development. This experience, and the demand for specific training and support for head teachers in many other countries, suggests that this as an area of work that merits investment and expansion. It is the kind of programme that will enhance and strengthen the status of teachers.

## 3.8 Conclusion

Open and distance learning has been widely applied to teacher education and there is some record of success in its use for all four regular elements of the curriculum - general education, subject-specific knowledge, pedagogy, and practical teaching. With differing emphases on different parts of the curriculum it has been deployed for teachers at different stages of their careers, and in support of national programmes of development and of curriculum reform. The record of achievement is solid enough both to have some confidence in its use and to draw some generalisations about how to plan and manage it, the theme of the following chapters.

## 4. How is it planned and managed?

To sum up the argument so far, open and distance learning has been applied to the problems of both the initial education of teachers and their continuing professional development, with some evidence of success. In this section we ask how programmes of this kind can be planned and managed before going on to ask about specific management decisions in the four key areas of technology, funding, classroom practice, and assessment.

The prime task of the planner or manager is to match educational purpose, administrative structure, and teaching methodology. This cannot be done in a vacuum. The history of distance education is littered with projects that looked good initially but could not be sustained as they were not built into national educational systems. Decisions about such issues as the allocation of government resources, the recognition of qualifications, or the use of teachers college facilities or staff are all likely to have implications for the educational service as a whole. Some of the planning choices within open and distance learning will affect people outside a ministry of education: teachers' associations and unions will be interested in the conditions of service for teachers working in a new role; broadcasting agencies, asked to transmit broadcasting materials, will certainly have a view about the timing of broadcasts and may want a measure of influence or even control over their content.

Identifying the educational purpose is all-important. If the purpose and audience lend themselves to open and distance learning, then it makes sense to explore the nonconventional options open to the manager alongside the conventional approaches of teacher education. The point of these guidelines is not to argue for the application of open and distance learning to every problem in teacher education but to suggest where and how it can be used. The most successful programmes are those where open and distance learning is closely integrated with other approaches to education and professional development.

### 4.1 What is the policy framework?

The planning of open and distance learning may involve policy issues at international, national and institutional level.

The international issues arise in part because the forces of globalisation are affecting the content and practices of education, in part because new policy issues arise when education is no longer confined within national frontiers. Programme planners are thus increasingly exposed to innovations in teacher education and need to make judgements about the desirability, feasibility and acceptability of these internationalised ideas within their country and programme. Changes to more practice-based teaching education, for example, have been encouraged internationally and become part of the common discourse about education. As we see in chapter 7, this has major implications for the local planning, implementation and management of programmes for teachers. International conventions on the role and status of teachers as agents of change naturally affect national policy. At the same time, educational cooperation across borders, and cross border enrolment, put on to the decision-maker's agenda jurisdictional questions about cross-cultural transference and language and about the control of cross-border enrolment and its accreditation or recognition.



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At the national level, lines of responsibility for open and distance learning within government are likely to be complex and do not just lie with the education sector. Increasingly, the development of distance education raises questions that have to be answered within a national communication policy, part of which will be a policy for the educational use of communications. Political, economic, technical and regulatory issues may all need to be considered. Some of these issues concern the respective roles of the private and public sector; educational institutions are likely to seek access to telecommunications on favourable terms, possibly through the use of governments' regulatory powers in the telecommunications sector, or may want more freedom to use telecommunications than has traditionally been available. Other areas to be considered in a communications policy include:

- investment policy, in relation both to the public sector and to the encouragement of particular areas of private-sector investment;
- policy on tariffs and on any common carrier requirements;
- government purchasing policy, and policy for the use of communication technologies for government's internal communication;
- technical standards including frequency allocation, systems reliability;
- the national development of national capacity and expertise;
- scheduling, influence, control over content and intellectual property;
- issues of equity and access.

Within the education sector, decisions about such issues as the allocation of resources, fee policies, the recognition of qualifications, the regulating and monitoring systems needed or the use of teachers college facilities or staff are all likely to have implications for the educational service as a whole. Questions need to be addressed about the most appropriate contribution open and distance learning can make to different levels and types of education, including primary, secondary and tertiary education, and technical and vocational education and training, as well as to teacher education. Questions are also likely to arise about the national or regional location of responsibility for distance education. Many planning decisions will affect people outside a ministry of education: teachers' associations and unions will, for example, be interested in the conditions of service for teachers working in a new role.

For institutions changing to dual-mode status, a key issue will be the balancing of resources allocated to open and distance learning against those of conventional provision and the systematic planning of policies to manage institutional change effectively. This is likely to include new faculty policies (new contractual and workload agreements, training, renegotiation of union contracts, evaluation and support); student policy issues (materials delivery, library access, counselling, financial aid, registration and record-keeping, technical support) and legal policy development (intellectual property including ownership of materials, copyright, and faculty, student and institutional liability).

## 4.2 What different elements do you need to make it work?

As we saw in chapter 2, the use of open and distance learning forces us to distinguish between a number of different educational and administrative jobs that may be done by a single institution, even a single person, in conventional face-to-face education. In open and distance learning functions are divided between different sections of the same organisation, or between

different organisation. Where a project or programme is to enrol, advise, teach and examine students it needs structures for a set of different functions. (Programmes that simply provide resources for teachers, whether through print or broadcasting or on the internet, as opposed to courses on which learners enrol, will need appropriate structures for making and distributing the resources but not the whole range of functions set out below.) To make distance education work you need structures and facilities for:

- governance, planning, management and funding
- materials development and production
- materials reproduction and distribution
- student recruitment and advice
- student support including the supervision of classroom practice
- assessment and evaluation of learners
- feedback system/formative evaluation
- record systems.

Any organisation needs a governance structure that will make major policy decisions; arrangements of planning, management and funding are likely to be the responsibility partly of people working within a distance-teaching institution and partly of people outside. The development of teaching materials – or their acquisition from outside – is a basic function: distance education depends on such materials. They may be developed in-house, or by external course writers, and are likely to be in a variety of media. An institution will need not only writers but people who can edit materials, so that they work effectively at a distance, and people to brief and train writers and editors. Materials then need to be reproduced, if they are in the form of print or cassettes or cd-roms and distributed. Broadcasting or videoconferencing also demand a distribution function of a different kind. Structures and systems are needed to recruit students and advise them about the programme. Most students needs support, guidance, and feedback on their work. Where teacher-education programmes include a practical element, concerned with their competence or skills in the classroom, arrangements are also needed to supervise this. Then, in many programmes students need to be assessed and their work examined or evaluated. Finally, a feedback system on the work of the institution or programme as a whole is needed to provide checks on how well it is working while a record system, important for any form of education, is indispensable where students are dispersed, needs to be designed and maintained.

Each of these topics demands attention. There are many guides to them, some of them identified in the annex. We look in the following four chapters of the guidelines at the key areas for the purposes of teacher education of technology (which shapes decisions about materials development and support for students), funding, classroom practice and assessment. The identification of these elements makes it possible to go on and look at the choice of models for managing them.

## 4.3 What models are there for managing it?

A variety of different structures or models have been used for teacher education at a distance and are set out in table 4.1.

In some cases a ministry of education has set up a project directly, making ad-hoc arrangements for all the necessary functions. This was the case, for example, in both Tanzania and

**Table 4.1: Some models for organising teacher education**

| *Model* | *Example* | *Comments* |
|---|---|---|
| Ad-hoc arrangements made by ministry of education | MITEP Uganda | While this makes it possible to deploy resources quickly it may not be a sustainable model |
| Single or dual mode teachers' college | NTI Nigeria<br>Belize Teacher Training College | The Nigerian case is the only example of a specialised distance-teaching teachers' college |
| Single or dual-mode university | IGNOU<br>UWI | Many universities with distance-teaching capacity have been asked by MOEs to run programmes for teachers |
| Multi-country programme | RESAFAD head teacher training<br>University of the South Pacific | Can share international resources and be of particular value for small states |
| NGO single-purpose project | OLSET | Speed and vibrancy of ngo activity has to be balanced against problems of sustainability and of coherence with government activity |
| Consortia and partnerships | TV Futura Brazil | If problems of integration can be overcome, a partnership of this kind may, as in Brazil, bring together an ngo, a broadcasting station, schools and a private-sector publisher |

Uganda, at different dates, in order to run an emergency programme to expand the number of teachers rapidly. While this had the merit of speed, and meeting immediate demands, it has not generally resulted in a sustainable system.

Then there are many examples in which prime responsibility rests with a teachers college. Most often this has meant that a college, which is already teaching conventionally, acquire new responsibilities for teaching at a distance. The Belize Teacher Training College developed a new, part-time distance version of their conventional initial teacher-education programme, drawing on existing faculty members to develop distance materials but also to train new classroom supervisors and assignment markers at a district-level. Staff had to acquire the skills needed for these new roles. In Nigeria, uniquely, the National Teachers' Institute exists just for teacher education and teaches entirely through open and distance learning. The advantage of these approaches is that the colleges should already be familiar with the needs of teachers and potential teachers and may have an infrastructure for supervising teachers in the classroom. At the outset, however, a teachers college which is beginning distance education needs to develop skills – in material development for example – that its staff do not already possess.

Universities have also been called on to play a role here. They may have two areas of expertise: in teacher education where they have a faculty of education and in open and distance learning. Using a university for teacher education makes it possible to take advantage of structures and systems that are already in place. There may, however, be problems of fit and adjustment if a university has no experience, in, say, the education of primary-school teachers which has generally been the responsibility of non-university teachers colleges. There have also often been practical difficulties within dual-mode universities in the almost indispensable job of developing materials. Staff tend to have competing pressures, too little time to write, and to

be working in an environment where there is only a shallow pool of writers. The introduction of distance education can also be met with considerable resistance by faculty members since it implies a change in cultural practices. It can bring changes to workload and job security, may involve changed job descriptions and even a threat to a traditional autonomy over content; it may demand an unfamiliar approach to team work.

We can distinguish here between universities with both conventional and distance-teaching capacities and open universities which teach only at a distance. Dual-mode universities themselves vary. Distinctions can be drawn in terms of organisational integration or the capacity of a distance education centre. In some cases, for example, only a handful of courses are available through distance learning and administrative arrangements for open and distance learning affect only a minority of university staff. In contrast some mixed-mode institutions have integrated distance education in such a way that there is a breaking down of distinctions between on- and off-campus teaching. In some institutions, the capacity of a central distance-education unit may be purely administrative. In others, it has overall responsibility for the pedagogical quality of distance education materials, and for staff training. All of these variations in university practice will have a bearing on the skills that can be deployed by a university in a teacher-education programme.

Universities have run programmes of two kinds which, over-simplifying, can be described as supply-led and demand-led. In some instances ministries of education have turned to a university to run a national programme because it has the infrastructure for materials development and distribution. In other cases, a university has developed courses, especially for continuing professional development, because it is itself aware of a demand from teachers that will help their professional development. Indira Gandhi National Open University in India, for example, runs programmes on which students enrol individually, paying their own fees, in order to raise the level of their qualifications.

Three other kinds of model can be identified. There are examples of nongovernment organisations working on one aspect of teacher education, setting up their own structures either in parallel with or linked with the public education service. With external, donor, funding the Open Learning Systems Education Trust (OLSET) in South Africa, for example, is offering training for teachers in the context of its radio programme for schools. Nongovernment organisations have played a particularly strong role in a region like Latin America where a pluralist tradition encourages them and assumes they can have a role in public education. There is also limited, but growing, experience of programmes that go across frontiers. The regional universities in the West Indies and the South Pacific have responsibilities in teacher education. The growth of telematics has promoted cross-country teacher education initiatives such as T3 in Europe and STAMP 2000+ in Southern Africa. The T3 project, a consortium of universities and other partners in seven European countries developed a European-wide agreement on the content and certification of information and communication technologies in schools. STAMP 2000+, initiated by the Commonwealth of Learning, is a co-operative programme designed to bring the benefits of distance education to the training and upgrading of unqualified upper primary and junior secondary teachers and administrators in eight southern African countries. In francophone Africa RESAFAD has been working on projects to develop resources that can be shared across frontiers. In most of these cases other than the regional universities, these projects have been concerned mainly with the development of materials rather than with the creation and management of a whole teaching system.

We look in the next section at the role of partnerships of various kinds.

In choosing between the models it makes sense to begin by seeing what is available in the environment. If there is an existing open university, or a university with a distance-teaching department, it may make sense to use their infrastructure rather than creating something new. But this will not always be the case: a ministry of education may have such different priorities from a university that it makes more sense to create a separate structure. Sometimes, there are also advantages to bypassing the traditional system in an attempt to be free from its political or pedagogical constraints, or its inertia. Both OLSET and TV-FUTURA found that, by operating outside the state educational system, they were able to offer practically orientated teacher-led content that was not readily available through the state system. This benefit needs to be set against the risks, in terms of acceptability and sustainability, of operating outside, if alongside, the system.

The choice between options – or the development of a new combination of them – is likely to be a function of five issues: governance, funding, timing, capacity and scale.

Questions of governance are about responsibility for and control of the various parts of the distance-teaching system. Who decides about which of the functions identified above? How are conflicts between any of the parties resolved?

The level and source of funding may be critical: donor funds, for example, may be available only to a government agency or, the reverse, only to an NGO.

If a project is for a limited purpose and for a short period then ad-hoc arrangements may have a positive advantage. Tanzania, for example, was able to set up a teacher-education programme to expand its teaching force in a short time, calling on a wide range of national resources, in order to train an urgently needed 40,000 teachers. But it is often difficult to turn short-term arrangements into a permanent system and a one-off emergency solution to a problem may jeopardise the development of a sustainable structure.

Where an institution – whether an open university or an international agency like the Commonwealth of Learning – has existing capacity to undertake some distance-education functions, this may be a powerful argument for using them and setting up a programme in cooperation with them. In contrast, if a college is launching a new programme of distance education, as was the case with MIITEP in Malawi, it will be necessary to set up the necessary infrastructure to develop materials and teach students.

The scale of a programme, or of a country, may determine the model to be chosen. Small states in particular may need to rely on a regional or international institution because of the limited facilities within country. Teacher education at a distance has, as already noted, been a major interest of the University of the South Pacific since its establishment.

In considering the balance of advantages for any one model, and developing proposals that take account of those issues, the most useful touchstone may be to consider the links between the programme and the rest of teacher education. Unless these links are in place then an unorthodox programme has little chance of effectiveness or even of survival. In developing the links it is necessary, too, to keep in mind relationships between the centre and the periphery: from the student-teachers' point of view the centre may be the school in which they are working and the distance-teaching institution the periphery; from the ministry of education, both may look remote. From the planner's point of view the links between them are of paramount importance.

## 4.4 Can you have partnerships and how do they work?

In many cases, it will not be possible for any one institution to carry out all the functions needed for open and distance learning and they will be shared between several partners. An open university, for example, may be contracted by a ministry of education for the development and central management of a programme but this is likely also to involve coordination or cooperation with any national accrediting agency, with curriculum bodies and possibly with public or private-sector broadcasting organisations. Cooperation with local colleges of education may be necessary for the supervision and management of the practical side of teacher education. The National Teachers' Institute in Nigeria depends on educators from local higher education institutions to supervise and assess their trainees' practical teaching at least three times annually during the four-year course. The China TV Teachers College provides core courses for its students but depends on Provincial Radio and Television Universities or other local educational institutions to supply learner support and local organisation, including the enrolment of students and management of the course. In practice, the whole organisation and balance of the course components is dependent on local conditions and can, therefore, vary considerably in quality. Mixed-mode delivery systems can involve a complex range of partners. The MIITEP programme run by the University of Malawi has a college-based and a distance-mode phase. During the college-based phase, teaching practice is assessed by teaching college tutors while in the distance phase, trainees are assessed by the host school's headmaster four times a week, regional supervisors (from local colleges) twice a term and college tutors five times during twenty months.

Partnerships tend to be fragile especially where different partners could, if they chose, replace each other. They are stronger if their functions are quite different, as, for example, where one partner has a mechanism for developing material and another for accreditation but with no overlap between them. The idea of partnerships has been driven by three forces: the shift towards greater decentralisation, an increase in school-based teacher education and decisions to integrate distance education and conventional approaches. While the benefits, and sometimes the necessity, of partnerships are obvious, they present management difficulties and

> as might be expected, have functioned with varying degrees of success. The complexity, time and cost of managing these crucial relationships with partners tend to be underestimated at the outset, especially when several colleges and regional or district authorities are involved. Furthermore, consistency of quality is not easy to achieve in large geographically dispersed programmes with decentralised field operations, which also need to be responsive to local conditions. Problems in managing the system revolve around issues of responsibility, role definition, accountability, location of decision-making, communication and the control and co-ordination of part-time support staff.
>
> Robinson, 1997: 126

Programmes which appear to have been most successful at achieving effective articulation and channels of communication are those that are very systematic in their planning and spend time, ahead of implementation, in identifying needs, on the basis of consultation and among a wide range of stakeholders. This seems to be symptomatic of distance-education programmes and initiatives which have been freed from a pressing imperative of going to scale; which, instead, have recognised the importance of building up a consolidated base as a prerequisite for effective delivery. Key elements seem to include strong programme direction

focused on strengthening co-ordination between partners, an internal research and feedback capacity and a concern to pay equal attention to the development of central and decentralised capacity. In India, for example, a district-based programme for the development of primary education has used open and distance learning alongside other methods of teacher education. It has combined strong decentralised decision-making and management with unequivocal support, if not direction, from the ministry. This support has opened up access to existing state teacher education structures, resources and channels of communication at different national, state and local levels.

In some cases partnerships have gone beyond frontiers. In West Africa, for example, the programme to train head teachers in Burkina Faso was able to draw on resources from educators throughout the region. Teacher education in the Caribbean draws on regional resources through the University of the West Indies, which is owned by the governments of the region. In a recent development, teacher education in Dominica and St Lucia has been supported by a collaborative project with Canadian universities. External support and exchange (beyond funding that we look at in chapter 6) may make it possible to:

- get information about similar activities elsewhere: international agencies including UNESCO and the World Bank publish information about open and distance learning while a number of information agencies have specialist interests in the area (see Annex);
- share teaching materials with other institutions or acquire material from elsewhere: both the Commonwealth of Learning, in the Commonwealth and CIFFAD in francophonie have policies and programmes to encourage such sharing;
- get professional advice or consultancy on particular specialisms in open and distance learning: consultants have often been used in planning and development phases;
- seek specialist education and training: programmes in the practice of distance education have been provided to learners internationally by, for example, Indira Gandhi National Open University, Deakin University in Australia and the University of London among others;
- enrol on courses internationally.

This last has got increasing international attention with the development of e-learning and the promise that internet-based teaching will share the world's educational resources and make distance education more widely available than ever before. Hype has reached beyond sensible hope. While there have been a handful of programmes that use the new technologies to deliver teaching across frontiers, as through the African Virtual University for example, little of this material has been designed for teachers and much of it has amounted to the delivery of lectures over a long distance rather than the creation of an educational programme. As chapter 5 explains there are serious limitations on the capacity of the internet to meet the needs of students internationally while the most demanding issues for the planner are often about student support and local classrooms, not about the development of impressive teaching materials or their delivery. Materials to support teachers are becoming available on the internet; both UNESCO and UNICEF, for example, have websites for this purpose.

In exploring the possibilities for international cooperation the planner will want to define the terms of the cooperation and is then likely to be guided by seeking a balance between the qual-

ity and economy that may be achieved by the use of external resources and the need for teacher education to match its national or local culture. In relation to teaching materials, for example, it may be possible to find high-quality materials developed elsewhere that promise good results in, say, mathematics. It is less likely that a course on classroom interactions, or relations between the home and the school, will easily travel across national or cultural boundaries. (Many educators lean towards the cautious here: while textbook publishers produce and distribute the same book to meet needs in half a continent, distance-education managers are more reluctant to use or adapt something produced even in a neighbouring territory.) Where whole teaching programmes are available across frontiers, these questions about cultural appropriateness are accompanied by issues about accreditation and recognition, and about local and national capacity building. As and when internet courses become more fully developed, educational planners will increasingly need to decide how far to recognise qualifications, obtained outside their jurisdiction, and how far their availability helps or constricts national development.

There are increasingly important regional developments in open and distance learning. The project in Burkina Faso is one example. Within the European Union, the European Commission has encouraged cooperation in all areas of education through open and distance learning and the use of the new technologies. In southern Africa there is a long history of cooperation, including the cooperative development of teaching materials for distance education. From the planner's point of view, regional possibilities may look more fruitful than wider international cooperation, especially if there is a history of educational cooperation within the region.

## 4.5 Who does what in each of the models or partnerships?

Whether a teacher-education project us run essentially by a single organisation, or through a partnership between several of them, decisions are needed about the allocation of functions to different members of the partnership. In table 4.2 we examine the location of the functions identified above in various different models and structures.

The seven programmes included in the table demonstrate the extent to which teacher education at a distance usually involves cooperation between partners. Perhaps the National Teachers' Institute in Nigeria has the greatest degree of autonomy in its work as a federal institution, with power to run its own examinations and award qualifications, and the capacity to work throughout Nigeria. But, not least because of the scale of the country, it needs to work with other institutions to provide the limited supervision it can undertake of teaching practice. Another institution with considerable autonomy, OLSET, has fewer links with other agencies than most in the table but a consequence of this is that it is not able to have the close contact with learners required for more formal courses. Nor is it involved in award of qualifications. At the opposite extreme, in terms of autonomy, is the District Primary Education Project in India which was designed both as a cooperation between a range of different institutions at federal, state and district level and as one in which open and distance leaning was integrated with conventional teacher education.

The effective management of open and distance learning demands some central management of planning so that materials development, production and distribution is often run from the centre; student recruitment and some student support may often rest there. Collaborative arrangements are most often needed for the supervision of classroom practice and for

## Table 4.2: Distribution of major responsibilities within individual distance teacher education programmes

| *Location of responsibility* | *Certificate with School Experience, Belize* | *MIITEP Programme, Malawi* | *PGCE, Open University, UK* | *DEP-DPEPII, IGNOU, India* | *English in Action, OLSET, South Africa* | *A-Plus, Brazil* | *National Teachers' Institute, Nigeria* |
|---|---|---|---|---|---|---|---|
| Governance, planning, management | Ministry of Education and Belize Teacher Training College (BTTC) | MoE | OU guided by Teacher Training Agency (TTA) | Collaboration of national, state and district agencies with management decentralised to districts | OLSET | Consortium of private-sector and ngo agencies | NTI |
| Funding | Government | Government | Government | Government | Donor | Private sponsors | Government, student fees |
| Materials development and production | BTTC | University of Malawi | OU with BBC for broadcasts | Indira Gandhi National Open University (IGNOU) in collaboration | OLSET | TV-Futura with Community Mobilisation Network (CMN) | NTI |
| Distribution: material reproduction and distribution | BTTC | 6 Teacher Training Colleges | OU - BBC | IGNOU in collaboration | South African Broadcasting Corporation, community radio stations, OLSET | National educational channel and local re-broadcasting | NTI regional offices in 36 states |
| Teacher trainee recruitment | BTTC | District Education Officers and TTCs | OU | Shared between IGNOU Delhi, IGNOU regional centres, District Institute of Education and Training (DIETs) | OLSET district coordinators | TV advertising and CMN | NTI regional offices |
| Tutoring and counselling student support | District Education Centres, BTTC, field supervisors | District tutors | School-based mentors and OU tutors. | Local and district coordinators | OLSET district coordinators | CMN and school coordinators | NTI |
| Teaching practice supervision | District classroom teacher-supervisors | College-based phase: college tutors. Distance-mode phase: head teachers, regional supervisors and college tutors | School-based mentors | School-based | Occasional by district programme supervisors | None | Limited, by staff of teachers' colleges |
| Assessment or accreditation assessment and evaluation of learners | Level 1: MoE<br>Level 2: Joint Board of Teacher Education | Malawi National Examination Board | Certificate awarded by OU. Recognition as teaching qualification by TTA | IGNOU | None | None | Accreditation: National Commission for Colleges of Education.<br>Teaching practice externally moderated by mainstream teacher education colleges |

accreditation. The British Open University, for example, which has the capacity to undertake most of the functions, set up an extremely decentralised system for support of its certificate students, where mentoring became the responsibility of individual schools throughout the country. In both Belize and Malawi supervision of classroom practice was devolved from the centre to the staff of teachers' colleges. The two nongovernment programmes in Brazil and South Africa were not able to provide regular supervision. In these examples, responsibility for accreditation tends to rest partly or wholly away from the main distance-teaching agency. Even in the British example, where the university has the power to award degrees and certificates and does so in this case, the recognition of the certificate, as something that gives the holder the status of a qualified teacher, rests outside the university. In Belize issues of accreditation take the institution outside national frontiers: responsibility for level one of the certificate rests with the ministry but for level two with the Joint Board for Teacher Education, based at the University of the West Indies, and responsible for teacher education outside Belize as well as within.

Two lessons emerge for the planner. First, it is often possible to find an agency with capacity in some areas of teacher education at a distance within the educational system. You do not therefore have to do everything on your own and, at the planning stage, it is worth exploring where different responsibilities can best lie. Second, collaboration tends to be difficult and demands links at various levels within the organisations for smooth running and the resolution of conflicts. The links may be particularly difficult to articulate in large, federal, countries where resources may be needed at federal, provincial and district level. At the other extreme, open and distance learning may stretch the capacity of small states, with little experience in open and distance learning, and relatively few potential writers or tutors in any one institution.

There is, of course, no ideal or universal model for cooperation between agencies and the allocation of functions between them will be shaped by local needs and circumstances. What is common is the need to identify where the location of all the functions needed for effective distance education, to agree on shared or divided responsibilities where they fall to different parties, and to ensure that funding for the different elements is available and its distribution seen to be equitable. Transparency will buttress equity.

## 4.6 Who should do the planning?

The answer to this question depends on the organisational model chosen and the location of the initiative to use open and distance learning.

The main general principle is to involve all stakeholders. In most jurisdictions the support of a ministry of education is crucial for teacher education and it may also be necessary to consult with a teachers service commission, if it has a role in the employment of teachers, and any accrediting agency. Teachers associations and unions have a role to play both in planning and in considering the effects of teacher-education programmes on their members' conditions of service and opportunities for professional advancement.

Many programmes of distance education have made extensive use of external consultants. In some cases - though most often for the establishment of new open universities - international planning commissions have been established in order to bring together different national approaches. In others, consultants with a particular specialism have been brought in to advise on technical aspects of open and distance learning, often in materials production and in evaluation.

General advice is difficult other than to recommend using local resources, looking for a combination of people who each know about some aspect of what is to be done, and a strong degree of scepticism about advice form outsiders.

## 4.7 Planners' guidelines for choosing between the options

We can sum up the argument of this chapter briefly.

- Work within a policy framework that ensures your programme fits its national context and, where appropriate, its regional or international one. This may well involve looking at issues of communications policy as well as of educational policy.
- Identify the range of functions you need for your educational purpose and audience and make a dispassionate analysis of where these functions should be located and who should undertake them.
- Establish the strongest possible links between open and distance learning and conventional teacher education.
- Consult widely and ensure the support of stakeholders, establishing a system for continuing contact with them.
- Seek regional and international cooperation insofar as this fits with your aims.
- Consider what kind of partnership is necessary for your work and what strengths different agencies will bring to it.

## 5. What technologies can we use?

We stressed in chapter 2 that a range of technologies is available and that open and distance learning is not limited to correspondence lessons - old-fashioned and boring as they sound - or to the internet - exciting but often unrealistic especially in many developing-country contexts. To choose between technologies we need to look a their strengths and weaknesses, to ask whether the infrastructure is in place to use them, and to examine the costs.

There is no single answer to the question 'which technology is best?' Indeed, one starting point for choosing technologies is to recognise that media do not differ in their effectiveness. Of course a particular subject, or a particular kind of learning, may lend itself to a particular medium; print is not ideal for learning the pronunciation of an unfamiliar language and following a radio programme is not the easiest way to learn how to strip a carburettor. But a long line of research, and much practical experience, has shown that where you can compare different media for teaching the same subject matter, there are no significant differences in teaching effectiveness between different them (Clark 1983). Intuitive views about the superiority or inferiority of any one medium need to be treated with caution. There is experience of using radio for teaching mathematics, for example, while it has been seen as having advantages over television for some approaches to teaching art: you cannot see teacher's painting and copy it. The result is that we can choose our technologies on grounds such as their appropriateness, convenience and cost, reassured that many different combinations of technology are likely to be effective. There is some evidence to suggest that combinations of media are likely to be more effective than any single medium. Practicalities buttress this argument: if something is available both on the radio and in print then you have an alternative if you miss the radio programme or if the printed document does not arrive. A careful blend of media, drawing on their individual strengths and minimising their individual limitations, is likely to produce the best results.

### 5.1 What are the choices?

Within open and distance learning, technologies are used for two contrasting purposes: to distribute teaching material and to stimulate learning by means of one-way or two-way communication. An appropriate technology needs to be found to distribute material to students. In the case of physical teaching material, such as books or audio cassettes, material has to be carried direct to students or to a point from which they can collect it. It may be possible to use existing channels of communication with teachers for this purpose, or to rely on the post, or to set up a dedicated service. Broadcasting, by radio or television, videoconferencing and computer communication all offer means of delivering teaching material to learners without these physical arrangements.

Teaching involves more than distribution. Well-designed printed materials, cassettes, or broadcasts are usually designed to promote learning, often by stimulating an active response from the learner. In choosing technologies, therefore, the policy maker has to consider not just how materials will be distributed but how they can be designed to facilitate learning and to resolve tensions between these two aims. Television, for example, may look the best medium for showing a simulation in engineering but is inappropriate if the only available television hours are at an inconvenient time or on a channel which does not reach most of the learners.



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If open and distance learning is to involve more than providing resources to teachers, it also demands two-way communication. This may be immediate, in the case of telephone tutoring or videoconferencing with a two-way audio circuit, or delayed, typically through the use of written assignments. New technologies are reducing the lengths of the delays here: it is sometimes possible for learners to send assignments to a tutor by fax or email. Two-way communication is also possible, of course, through face-to-face contact. In making decisions about technologies we need to consider not just those that are mediated but also the role of face-to-face contact if this is part of the distance-education system we are creating. Thus, the planner's decisions are usually about a set of technologies, chosen according to their appropriateness for the subject matter and the audience, and to their cost. The Open University certificate programme, for example, used printed material as the main means of presentation of the subject matter and distributed this partly through the mail and partly by internet. It was a specialist course, aiming at a much smaller audience than a foundation-degree course, and was not therefore able to use a large amount of television. It used a combination of face-to-face sessions and computer conferencing for dialogue.

A classroom teacher, writing on a blackboard, and getting questions from students does all three at once. In open and distance learning we may use print to present material, the mail to distribute it, and face-to-face tutorial sessions for feedback and dialogue.

Planners are likely to be able to choose between some or all of these technologies.

- Print remains the staple of much open and distance learning, providing a permanent document that is convenient to use. Distribution may be physical or electronic. Print allows two-way communication but only with a delay.
- Radio has been widely used for formal and informal teaching, helping to bring teaching alive, and overcoming the problems of physical distribution that may limit print.
- Television has obvious merits but tends to have costs ten times those of radio.
- Cassettes have been used for similar purposes to radio, overcoming the problems of timing that limit the use of broadcast radio.
- Videoconferencing allows specialists at a centre to reach scattered audiences provided they have the equipment to take part. Many videoconference systems allow for one-way video and two-way audio so that, for some of the audience, it becomes a two-way medium.
- A variety of computer-based technologies have been used including the distribution of sample lesson plans on cd-roms, setting up exchanges by computer conference between teachers' colleges, encouraging the interactive use of computer-based learning materials, encouraging the use of web-based materials, and using computer conferencing to encourage discussion among learners.

In making choices the planner is likely to be influenced above all by the convenience of the learner, the cost, and the need for a culture of maintenance. It will be necessary to maintain hardware and software: physical equipment needs maintenance and access to specialist staff and supplies. Software will need updating and improving on a regular basis. Unfortunately many programmes have neglected the importance of maintenance or of budgeting for it, referred to in chapter 6 below.

In table 5.1 we expand on this brief summary, identifying the strengths and weaknesses of a range of technologies for teacher education.

## Table 5.1: Media and technology uses in teacher education

| *Function in teacher education and development* | *Strengths* | *Limitations and requirements* |
|---|---|---|
| **PRINT** | | |
| Provides information, concepts and examples in a structured way.<br>Can teach academic subject content, education theory and knowledge about pedagogy.<br>Can link subject knowledge to school curricula and teaching methods.<br>Can combine expert input with teacher-produced materials. Can show teachers' lesson plans, extracts from teachers' diaries and accounts, diagrams of classroom or equipment layout and examples of pupils' work.<br>Can provide transcripts of teacher-pupil interaction for analysis.<br>Can provide guides to action for teachers (e.g. in implementing new curricula or doing action research). | A learning resource in a permanent form, permitting individual or group use.<br>A portable and convenient resource.<br>Copies can be used by more than one teacher.<br>Good for explaining theory and concepts and providing detailed information.<br>Can include a variety of source materials.<br>Can be low cost but scale affects costs.<br>Provides a common standardised resource.<br>If well designed, can combine effectively with other media.<br>Can play a variety of roles, from lead medium to supplementary resource. | Physical distribution of the materials can be slow or difficult in some contexts.<br>Fixed content, not quickly responsive to sudden changes in school curricula or educational legislation or teacher education curricula.<br>Requires relatively lengthy preparation time and team-working by those producing the materials.<br>Cannot show teaching-learning interaction at work in real time in classrooms.<br>As a standardised resource, it may not meet the needs of minority groups or languages, or regional variation.<br>A one-way medium. Interaction is possible with the material, with the school environment applying ideas from the materials, with other teachers in local groups or with tutors. |
| **RADIO** | | |
| Provides topical information and current news for teachers.<br>Illustrates text content or addresses educational issues in a lively way, using authentic voices and varied sources (teachers, policy-makers, parents, curriculum developers, education experts).<br>Can raise awareness about education in a wider community audience.<br>Offers a forum for teacher exchanges (teachers' voices).<br>Can reach all or most teachers at the same time to support faster and more widespread information dissemination. | Often widely accessible by teachers<br>Can be responsive to teachers' needs within a short time-scale.<br>Provides immediacy in the materials.<br>Can be very low cost per teacher.<br>Equipment for production can be simple, relatively inexpensive and durable.<br>Use of local radio can increase the relevance of programmes and respond to local needs or languages.<br>Programmes can take a variety of formats and fulfil different purposes: a flexible medium.<br>Can integrate effectively with print. | Ephemeral or impermanent, content lost unless recorded.<br>Scheduled transmission times may be inconvenient.<br>Has a poor and unglamorous image.<br>Needs teamwork and collaboration when integrated with other media (can be difficult to achieve in practice).<br>Often limited by regulatory framework for broadcasting or lack of enabling policy for educational use.<br>Commercialisation of radio increasing costs for production or transmission.<br>Weak in conveying detailed or conceptually dense material.<br>One way medium. |
| **INTERACTIVE RADIO** | | |
| Provides well-structured lessons for teachers and pupils alike in a range of subjects.<br>Compensates for weak teacher-knowledge and can improve it at the same time. | Has proved effective in several contexts for teaching English as a second language, maths and other subjects.<br>Can reach a mass audience at relatively low cost per learner.<br>Can support teachers in subject knowledge and in demonstrating new teaching methods<br>Structures active learning as part of the lesson<br>Can provide models of lessons | Scheduling may be at inappropriate times.<br>Depends on regular and reliable transmission facilities and broadcasting infrastructure. Cassette tapes can substitute but lose immediacy and need physical distribution.<br>Needs skilled programme designers and structures for teacher support with training for them where interactive radio is new.<br>A one-way medium. Interaction is with materials, with and between children in class and ideally with other teachers. |

## Table 5.1: Media and technology uses in teacher education

| *Function in teacher education and development* | *Strengths* | *Limitations and requirements* |
|---|---|---|
| **AUDIO-CASSETTE TAPES** | | |
| Provides illustrations through sound.<br>Can give examples of concepts and theory. Can convey information.<br>Can provide discussion in a more natural way than through text.<br>Can provide detailed instructions (e.g. in using a computer or manipulating equipment).<br>Can provide sequences of conversation for close analysis.<br>Can be used as a teachers' 'talking newsletter'.<br>Can provide models of pronunciation.<br>Can act as a 'voice in the ear', to guide teachers through processes (e.g. learning to use a computer or observation tasks) | Offers a permanent resource for individuals or groups.<br>Is relatively portable. Cassette players are often widely accessible by teachers<br>Can be re-played, stopped and started at will by learner.<br>Combines effectively with print, and can extend the use of radio programmes through recording for re-play.<br>Is low cost to develop and duplicate.<br>Can be a more intimate or motivating medium than print, if not presented as a single-voice long lecture.<br>Provides good models in language learning and teaching, and sequences of natural conversation. Can demonstrate communicative approaches in language teaching.<br>Teachers can contribute to tapes or make them.<br>Can be used by tutors to give feedback to students. | Audio-cassettes can deteriorate over time.<br>Sound quality can be poor if a chain of recordings are made or if the equipment is poor.<br>Cassettes need good management (e.g. accurate labelling, storing, mechanisms for circulating among teachers).<br>Can fail to stimulate active learning if used just to deliver lectures.<br>Tape-editing time often underestimated.<br>Needs skilled integration with print or other media.<br>Content often needs designing differently from radio programmes.<br>A one-way medium. |
| **CD-ROM (COMPACT DISK-READ ONLY MEMORY)** | | |
| Provides access to information for teachers in text, graphics, audio and video form.<br>Can provide information on curricula content and teaching methods. | Can store large amounts of information on one disk.<br>Relatively cheap and simple to copy and distribute.<br>Provides random access to content, so a particular segment can be located without having to rewind as in audio-cassettes.<br>Can substitute for lack of access to databases where computers lack connection to Internet. | Requires a computer with CD-ROM drive and software to access the disk.<br>Stores less audio material than audio-cassette tapes.<br>More expensive than audio-tapes.<br>Making CD-ROM interactive increases development costs. |
| **TELEVISION** | | |
| Can reach a mass audience of teachers and the community.<br>Can raise awareness in the community at large about educational issues and teaching.<br>Shows processes in real-time or slowed down or in close-up (e.g. classroom interaction, language development, mathematical operations).<br>Shows a variety of school and classroom contexts and teachers in action which teachers would not otherwise see, given the isolated nature of teachers' work.<br>Gives teachers comparisons and benchmarks.<br>Can show specialists or experts at work.<br>Provides material as the basis of group discussion. | Can demonstrate real contexts and provide rich visual content. Can capture classroom realities.<br>Can combine a variety of content (e.g. site visits to schools; interviews, dynamic simulations, and examples of teachers' work).<br>Can be combined with other media.<br>Can provide topical content. | High programme development costs and may be high transmission costs.<br>But modest cost per viewer possible on large enough scale.<br>Not always accessible to all teachers.<br>Inadequate technical support at local level sometimes leaves non-functioning equipment.<br>Often inappropriate transmission times for teachers.<br>Sometimes replicates traditional lecture formats which fail to make effective use of the medium's capabilities.<br>One-way medium. May foster passive viewing.<br>Filming in schools requires considerable specialist skills and resources. Filming in studio classrooms is often easier but can lack authenticity. |

## Table 5.1: Media and technology uses in teacher education

| *Function in teacher education and development* | *Strengths* | *Limitations and requirements* |
|---|---|---|
| **VIDEO-CASSETTES** | | |
| Shows processes in real-time or slowed down.<br>Shows a variety of school and classroom contexts and teachers at work which the viewing teachers would not otherwise see.<br>Can provide separate segments for close analysis relating to different parts of the course materials, not only long sequences.<br>Commercially-produced video-cassettes, for example, on child development or other educational topics, can be 're-purposed' for particular educational uses (segments selected and printed guides produced in relation to them). | Can be relatively low cost, depending on development costs and scale of use.<br>Has some of the strengths of television but can be used in different ways for learning (under the control of the learner who can stop, start and re-play sequences).<br>Can provide material for close observation and analysis, if teacher is guided either on the cassette or in print. Can be used by individual teachers or groups.<br>Can be combined with print.<br>Is a permanent resource.<br>It can: support active learning with good instructional design; demonstrate teachers' beliefs and practices; stimulate discussion; show the realities of teaching in different schools and compensate for teachers' lack of access to other schools; show simulations and role play (e.g. in headteacher training) or children's work. | Requires physical distribution of video-cassettes and access to playback facilities convenient for teachers.<br>Quality (picture and sound) can deteriorate if copies of copies are made, rather than from the master tape.<br>The cassettes need good management (accurate labelling, storing, mechanisms for circulation).<br>Their role needs to be carefully designed to embed them in the course materials or in relation to active learning, if they are not to be a marginal resource.<br>Video may be poor technical quality (poor lighting and sound, one camera recording only the teacher (not the children) and poor educational quality (e.g. presentation of whole 45 minute lesson).<br>Editing time is often underestimated.<br>Needs professional makers to achieve good quality. |
| **VIDEO USE IN MICRO-TEACHING** | | |
| Provides a means for student-teachers to observe themselves on recorded video in a teaching situation or simulation, and to get feedback on their performance through viewing the video and discussion with tutor and peers.<br>Provides student-teachers with an opportunity for observing, interpreting and discussing the video material.<br>Provides opportunities for observing and comparing the performance of self with others. | Is effective up to a point, in assisting student-teachers to appraise their own and others' performance and assist the initiation of reflective practice.<br>Provides opportunities for practice and experiment followed by feedback; helps the student-teacher develop specific skills (such as questioning, explaining, managing time-on-task, setting up group-work, using a particular teaching method).<br>A short amount of recording can generate a large amount of discussion and analysis (5-10 minutes of recording can generate at least an hour of analysis and feedback) with a skilled tutor.<br>Gives attention to the individual student-teacher. | Is labour-intensive and small scale, therefore relatively high cost as a form of face-to-face teaching.<br>Effectiveness depends on the quality of the tutor or facilitator, the preparation by tutor and student-teacher, the tutor's skill in facilitation and timing of feedback.<br>Has been criticised as concentrating on isolated, decontextualised and specific teaching skills or competences rather than deep understanding.<br>Requires a room to be set up appropriately as a classroom, with adequate lighting and equipment but can be relatively low-cost to set up.<br>More difficult to do over a distance. |
| **AUDIO TELE-CONFERENCING** | | |
| Enables real-time interaction among teachers and educators in different locations.<br>Can bring together teachers, curriculum developers, specialists and policy makers in one event.<br>Can be used for presentations and teaching sessions, discussions, course delivery (in combination with other media) and student support. | Can support development of teachers across large distances, enabling contact between groups.<br>Is relatively easy to use (no large amount of technical know-how to master).<br>Can be cost effective but depends on context and comparisons with alternatives.<br>Can provide topical content at short notice more easily than print (has the immediacy (or more) of radio).<br>Can be combined with video-conferencing (one-way video, two-way audio) to reduce video-conferencing costs and to provide interactivity where the infrastructure or budget does not support two-way video-conferencing. | Facilitating group discussion across a number of sites needs high levels of skills and preparation.<br>Requires advance organisation, scheduling and coordination to make the event successful.<br>Special equipment needed so that learners usually have to travel to venue.<br>Costs vary in different countries, but can be cost effective when compared with alternatives.<br>Requires adequate telecommunications infrastructure to function and ensure adequate sound quality.<br>Requires additional materials or two-way graphics for some topics and subjects. |

## Table 5.1: Media and technology uses in teacher education

| *Function in teacher education and development* | *Strengths* | *Limitations and requirements* |
|---|---|---|
| **VIDEO-CONFERENCING** | | |
| Enables real-time interaction among teachers and educators in different locations.<br>Can bring together teachers, curriculum developers, specialists and policy makers in one event.<br>Can be used for presentations and teaching sessions, discussions, course delivery (in combination with other media) and student support.<br>Can show a variety of visual materials to participants. | Can support development of teachers across large distances, enabling contact between groups.<br>Can provide topical content at short notice more easily than print (has the immediacy (or more) of radio).<br>Can make scarce expertise available widely. | Has high start-up costs; usage levels need to be high enough to recover them.<br>Requires technical support, including at remote sites.<br>Requires students to travel to venue; given the cost of equipping sites, these are likely to be less local than options using different technologies.<br>Where teacher interaction is possible at the local or district level, video-conferencing is likely to be a more expensive option.<br>Where teachers travel long distances to in-service events, the video-conferencing option may be more cost-effective.<br>The added costs of the visual dimension may not provide matching benefits over audio-alone. |
| **COMPUTERS** | | |
| Provides access to information on CD-rom and local databases.<br>A means of preparing materials for teaching if consumables are available (e.g. cartridges, paper).<br>Provides computer-based learning materials for teachers and pupils. | Can provide access to large amounts of resources for teachers to select from and use as appropriate in their own contexts or for their own development.<br>Its use helps teachers to develop their own personal computer skills. | The quality of software or learning programmes is sometimes poor.<br>Technical support is needed and may be scarce in rural areas.<br>Access is sometimes restricted for teachers.<br>Training for teachers may be too little, and too narrowly focused on using the computer rather than using it for teaching and learning across the curriculum. |
| **COMPUTER COMMUNICATION** | | |
| Enables teachers to participate in larger professional communities, beyond their local ones.<br>Provides access to databases, either on a local area network provided by the education authorities, or the Internet.<br>Enables teachers to follow professional development programmes provided by remote institutions. | Can provide a wide range of multimedia materials, if the infrastructure (and bandwidth) permit.<br>Supports a range of interaction, from formal to informal of varying group size.<br>Can archive discussions for later use by other teachers.<br>Allows teachers to participate widely and to exchange experience and materials in peer groups.<br>Provides access to more sources of information and assistance, on topics from the specific ('How do I teach the new curriculum on environmental studies to Grade 3 children?) to more general educational topics. | Problems of access and cost in some countries. Requires an adequate infrastructure (electricity, telecommunications), affordable prices, supportive policy framework and investment of resources.<br>Requires a change in perceptions and practices in teaching and learning (in contrast to common perception that having computer communications will of itself improving the quality of teaching and learning).<br>If lengthy print materials are produced through downloading, this may increase costs per copy over those of centralised print production and shift costs to the teacher, school or district.<br>Requires training for effective use (often neglected).<br>Requires considerable technical support. |

## 5.2 What about the new information and communication technologies?

While open and distance learning does not demand that we use the new, computer-based, technologies, they present enough opportunities for us to consider them separately. The development of computer links is beginning to blur the distinction drawn above between distribution and teaching. It is possible, through an internet connection, both to distribute material to learners electronically rather than physically and to teach them, by means of a computer program, or engage in dialogue with them by email or computer conferencing.

New communication technologies are being used with four different functions in teacher education, over and above their use as tools for the writing and production of teaching material. The first is simply to distribute teaching materials; from the educator's point of view it may make little difference if materials are distributed by post or by the internet, though the implications in terms of cost and convenience for the user may be very different. Second, in some cases electronic communications allow simulated two-way communication. This is the case where a trainee teacher interacts with a computer program instead of with a tutor; much early computer-based learning followed this model but it has been relatively unimportant for teacher education. Third, where computers are networked, or students have access to the internet, then computer-based technologies can be used for two-way or multi-way communication. Fourth, there is increasing diversification into resource-based, self-access teacher education in a variety of media. A range of dedicated websites have been created for the professional development of teachers. Wherever teachers have access to the internet, these sites can increase the exchange of materials and interaction between teachers and direct them to other teacher education resources, experts and professional associations.

Within teacher education, the new technologies have been used for two different purposes. One is training teachers to learn about information and communication technologies and their use in teaching as computers are introduced to schools. In many countries this is being done through face-to-face training programmes, often as part of initial teacher education. Some countries (such as the United Kingdom and Singapore) have developed policies which require all initial teacher education programmes to include compulsory courses in the technologies as a strategy for building capacity in relation to them. In other countries, no policy yet exists and teaching teachers about information and communication technologies is at best an option within teacher-education programmes.

The other role of information and communication technologies is as a means of providing teacher education, either as a core or main component of a programme or playing a supplementary role within it. In Costa Rica, for example, the ministry of education developed the use of the Logo computer program within schools as part of a programme of curriculum reform. Teachers colleges are beginning to experiment with the use of computer-based material to strengthen and broaden their curriculum. Both UNICEF and UNESCO are developing work of this kind.

While there is limited documented experience on the effectiveness of the new technologies for teacher education, the available evidence suggests that we can propose three lessons for planners, mainly about capacity building.

- First, the development of teachers' capacity in using the technologies cannot happen in isolation. Plans need to take account of the use of the technologies elsewhere in the

education system and in the wider environment. The technologies necessitate an appropriate technical infrastructure and funding to support it.

- Second, if the use of the technologies is seen as a function of teachers generally, this needs to be reflected in national policies and strategies and in the curriculum for both initial teacher education and continuing professional development.
- Third, while teacher educators are a key element in establishing the use of information and communication technologies in education, many teacher educators themselves lack skills and training in the use of the technologies or opportunities to apply and develop their knowledge and skills.

## 5.3 What are the prerequisites for each of them?

In choosing technologies we need to think both about their educational strengths and weaknesses, summarised in table 5.2 above, and about the prerequisites for their production, reproduction, distribution and use. If, for example, we want to consider using radio we need to ask who will produce the programmes, how they will be broadcast (by a local or national broadcaster, on what frequency and at what time, and at whose cost), and about their reception, exploring whether learners have access to radio and either mains electricity or an affordable supply of batteries. It is important to ask questions about prerequisites both at the centre and at the periphery: it is not enough to produce good materials if they cannot be distributed or, for lack of access or shortage of particular technical equipment, learners cannot use them. In Burkina Faso, for example, as one of the least developed countries with a scattered population, the infrastructure in place meant that it would be unrealistic to use any medium other than print for teacher education.

The scale, and organisational location, of the project or programme is likely to shape the answers to these questions. OLSET in South Africa has used radio for schools, at a modest cost per learner, because it is a relatively large country, using broadcasts in a single country, and with a national infrastructure that means many schools can use radio. In contrast, computer-based learning would not be realistic for its many rural schools. In Brazil and China the scale of teacher education is so big that it is possible for educators to have access to television through a non-government-private sector consortium in one case and a state-backed university in the other.

## 5.4 What do they cost?

In examining costs, we need to distinguish between total cost and cost per student or cost per successful student: as noted above, it is possible to justify the relatively high costs of a medium like television where student numbers are high enough to bring down the unit cost. Then, in examining each medium or technology, it is useful to ask three sets of questions. First, we need to distinguish between the cost of setting up or initiating work in a particular medium from its running costs. Next, we need to consider how far the running costs are fixed or vary, usually with the number of students. And, third, it is useful to distinguish between the costs of producing teaching material, the costs of reproduction, of distribution and of reception. At each stage the planner is likely to have another practical question: who pays. For some of the costs may fall on the institution, some on national, regional or local government, and some on the individual student. In table 5.2 we summarise the nature and location of costs for various media, looking at the same time at their possible use for one-way or for two-way communication.

**Table 5.2: Nature and location of some costs**

| *Medium* | *Features* | *Location of expenditure* | | |
|---|---|---|---|---|
| | | *Reproduction* | *Distribution* | *Reception* |
| Print | Initiation costs can be modest<br>Origination costs fixed; reproduction costs vary with number of copies<br>Level of costs differ widely according to quality of print<br>Can be two-way if assignments included | Institution | Institution | None |
| Television | Initial installation cost high<br>Production costs fixed<br>Distribution costs fixed for given transmitter coverage<br>Unit cost is likely to be high below 200,000 students then to rise again above 1 million<br>One-way | n/a | Institution but may be shared with broad-casting agency | Local institution for group study or student if individual to provide set |
| Radio<br>Audio/video cassettes | Installation cost relatively high<br>Production costs fixed<br>Distribution costs fixed for given transmitter coverage<br>Cost generally one tenth that of tv<br>One-way | n/a | Institution but may be shared with broad-casting agency | Student (e.g. batteries) |
| Videoconferencing | Significant installation costs at centre and at each location<br>Production costs may be low and are fixed<br>Distribution costs depend on means of trans-mission<br>May be two-way if audio feedback link is included | n/a | Institution | Institution |
| Production of computer-based teaching material | Some initiation costs<br>Production cost likely to be very much higher than for print<br>Distribution costs dependent on choice between cd-rom and internet distribution | Institution if cd-rom | Institution if cd-rom | Learner |
| Computer conferencing | No production cost. Distribution costs dependent on cost of access to telephone network<br>Running costs for institution vary with num-ber of students<br>Multi-way | n/a | Institution/ Student | Learner |

The actual costs of a particular technology will depend on local circumstances and it is not possible to set out an international set of standard prices. Even within a single medium or technology costs can vary widely: sophisticated television documentaries have far higher production costs than teaching programmes which consist of a talking head and the equivalent of a blackboard. But comparative costs show a fairly steady pattern. Research carried out within European higher education suggested the ratios set out in table 5.3. This analysis took as its starting point the fact that teaching material almost always started with a written text so that one could look at the comparative cost of producing material in a variety of formats as compared with the cost of preparing print. These figures are just for production: they do not take account of the reception costs that fall on the learner and leave aside the question of scale already identified.

**Table 5.3: Comparative production costs of some technologies**

| *Medium* | *Cost per student learning hour in 1998 US$* | *Ratio to print cost* |
|---|---|---|
| Print | 825 | 1:1 |
| Radio | 24,750 to 44,550 | 1: 50 |
| Television | 148,500 to 206,250 | 1: 180 to 250 |
| Audio | 280,050 | 1:35 |
| Video | 29,700 to 138,600 | 1:35 to 1: 170 |
| CD-rom | 33,000 | 1:40 |

Source: *Hülsmann 2000*

Costs for the new information technologies are only beginning to become available. Here we need to distinguish between the costs for preparing teaching material and for tutoring students on line. American research has indicated a very wide range of costs for preparing material that is presented by computer, with the lowest where this is simply using the computer to present print and the highest where designers move into simulations or virtual reality. The figures, shown in table 5.4, vary from $6,000 for a simple outline or $12,000 for a text up to $1,000,000 for a three-unit course. The beginning experience of online tutoring suggests that the costs of this may put strains either on budgets or on tutors' workloads, mainly because there is no ready way of controlling the time tutors spend responding to their students or the demands that students put on their tutors. If there is a computer conference, tutors may feel a responsibility to monitor its contents, regardless of the length of material placed there by students. Where students can contact their tutor by email, they tend to demand more of their tutors' time than when they are submitting a conventional assignment. In the absence of good cost studies of online teaching the only advice for the planner is to welcome the pedagogic advantage of being able to have ready contact with distant students while seeking a way of containing the costs.

**Table 5.4: Cost of developing a three-unit internet course 1998**

| *Type of teaching material* | *Cost in US$* |
|---|---|
| Course outlines and assignments | 6,000 |
| Text | 12,000 |
| Text with reference materials | 18,000 |
| Text with reference materials and images | 37,500 |
| Audio and video | 120,000 |
| Simulations | 250,000 |
| Virtual reality | 1,000,000 |

Source: *Arizona Learning Systems 1998*

## 5.5 Planners' guidelines for choosing between the options

International experience suggests that the choice of technologies should be guided by five factors:

- Convenience and availability for learners are all important: we need to ensure that the technology does fit with learners' needs and realities.
- Technology needs to be appropriate for the curriculum and for teaching effectiveness. While arguments based on minimising cost, and keeping technology as simple as possible, might often lead us to print, this is not ideal for all purposes and has limitations in terms of motivating students.
- Technical backup and support needs to be in place: it is no good relying on a technology if it cannot be used by students; many videocassettes sitting on shelves in remote villages bear witness to this. Maintenance needs to be planned for.
- The costs need to be affordable for the institution and for the learner.
- There are particular difficulties in achieving a balance here within small states where the use of sophisticated technology may force educators into dependence on external sources with the danger of cultural hegemony by large countries and large international companies.

In general the challenge is to find an appropriate trade-off between quality and cost, justifying any move away from the simplest and cheapest technologies but resisting untested arguments that they are the only ones to be considered.

## 6. How can you fund it?

Much education, at primary, secondary and tertiary levels has conventionally been funded by government and government funding has been the norm for many programmes of initial teacher education and training. But pressure on government funds has led many countries to explore alternative sources of funding so that education is also funded from four other sources: from student fees, community support, the private and nongovernment sector, and from donors and funding agencies. Programmes often receive funding from a combination of sources: teacher education at a distance in both China and Nigeria, for example, is funded partly by government, partly by student fees. In Brazil, as described in chapter 3, a programme of teacher education has been funded by a combination of private-sector and nongovernment funding so that the heavy capital costs of television are met by the private sector.

Many governments have been willing to fund not only initial teacher education but some programmes of continuing professional development, especially for curriculum reform or for some upgrading programmes in countries trying to raise the minimum standard of teacher qualification. Teachers are, however, often expected to pay fees where they enrol on a course of continuing professional development which will benefit them in terms of career advancement or salary increment.

Some parts of a programme may be funded by government but not through a ministry of education. If education can get access to state broadcasting time and facilities, at a nominal charge or free of cost, then broadcasting transmission costs do not fall on the ministry of education budget.

### 6.1 What are the consequences of each choice?

There are trade-offs between each of the options. In some jurisdictions there may be an expectation that government should meet the full costs of teacher education because of its importance for the quality of the education service as a whole. Total funding from a ministry of education may hold down available funds and will give the ministry - and its finance section - strong direct control over the programme. There may therefore be pressure on the part of the institutions concerned to seek funds outside the ministry or to pass on some of the costs to the learners. On the other hand, the imposition of student fees may hold down enrolment, discourage students, and is likely to be socially regressive. There is little reported experience of the use of community resources in teacher education of this kind. The nature of private-sector and nongovernment involvement is culturally determined: this sector is involved in the projects in Brazil and at OLSET in South Africa but there are significant differences between the two. The provision in Brazil is through funds generated within the country by an established consortium, while OLSET is dependent on external, donor funding and despite its successes, seems unable to attract government funding. The freedom of action and non-bureaucratic structure that marks effective nongovernment organisations has to be balanced against difficulties they may face in integrating their work with regular state activity and ensuring its sustainability.

External finance from funding agencies may also present problems of sustainability. Many funding agencies have been willing to meet capital costs, and to fund pilot projects, but expect governments to meet recurrent and continuing costs. Course development has sometimes, but not always, been treated as capital expenditure even though its major cost element is likely to



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be for staff time. The trade-off here is often between initial freedom of action, bought with external funds, and long-term integration and sustainability. In seeking that trade-off, it is unwise to brush aside questions about how to maintain a programme or project.

The best advice may be to be open-minded about the options and consider the possibilities of funding different elements of the programme from different sources. Box 6.1 shows how this was done in Malawi.

**Box 6.1 The Malawi integrated in service teacher education programme**

**This project in Malawi brought together funding from a variety of sources including the ministry of education, the World Bank, and the German aid agency GTZ. While some costs undoubtedly fell on the learners, they were not charged fees so that there is no contribution from them shown in this table.**

| *Area of work* | *Funding Source* |
|---|---|
| Planning and initiation | MoE (including 6 professionals from the Teacher Development Unit, experts from Malawi Institute of Education, the University and Colleges of Education).<br>GTZ - long-term expert in logistics. |
| Materials development | World Bank loan - curriculum review, 5 handbooks and other learning materials.<br>GTZ- expert in training and materials development, office support costs. |
| Materials reproduction and distribution | World Bank - printing of training material.<br>GTZ - office support costs and computer equipment. |
| Reception costs | n/a |
| Student support and classroom practice | GTZ finances activities for pedagogic support (zonal meeting and school-based supervision) plus vehicles for transport.<br>Colleges (college-based training by tutors, visiting college practical teaching supervisors) conventionally funded by MoE (central MoE for tutor salaries, Regional MoE for accommodating students during college-based phase).<br>MSSSP - transport for PEAs visiting schools. |
| Training and capacity building | World Bank loan to Malawi (training trainers, PEA's, headteachers).<br>Malawi School Support System Programme (MSSSP) - Training Development unit. |
| Maintenance | GTZ - long-term expert in monitoring and evaluation. |

## 6.2 What sort of funds do you need?

Funding is likely to be needed for costs of several different kinds and at different stages in the development of a project or programme. While open and distance learning does not require the building of colleges and halls of residence, it does require some capital investment, for the development of systems and materials, well in advance of student recruitment. This is a critical point which is not necessarily understood in new projects and which can create political and presentational difficulties: once a project has been approved and expectations aroused, it is difficult for planners to insist on a development period of one or two years when, to the outsider or the potential learners, there is little sign of action.

Different activities may be funded from different sources. Costs are likely to be incurred for initial planning, the development of materials, their reproduction and distribution, their reception, student support, training and capacity building, and maintenance.

There are costs associated with initial planning and initiation of teacher education at a distance, even if these amount only to the use of existing capacity within the educational system. These costs have often been found from regular government budgets. Where programmes are developed with external advice, external funding may be available for planning and initiation. The Asian Development Bank, for example, has funded explorations of the use of open and distance learning for teachers and for initial planning. Agencies like the Commonwealth of Learning have often been involved in the development of plans, sometimes with external funding.

The development of teaching materials, as already noted, requires expenditure before students are enrolled. A variety of strategies have been used for funding this, depending on the organisational structure chosen for the programme (see chapter 4). Difficulties can arise where teachers or trainers are already in government employment, working in education, but asked to develop materials as an extra or different job. In some cases regulations do not allow them to be paid extra; in others sanctions are impossible if they do not deliver the material. Strategies need to be put in place that allow for the effective development and editing of material that is fair to staff and ensures materials are delivered on time (see Perraton and Creed 1999). Funds for writers are not enough: editing of materials, to ensure their educational effectiveness and get them to camera-ready state or undertake desktop publishing, is likely to cost as much as their initial writing.

The costs for reproducing and distributing teaching materials may fall in various places. If material is broadcast, transmission costs may be met by the broadcasting agency. If learners have to collect materials, some of the costs of distribution fall on them. Where materials are distributed electronically then, once the capital investment has been made, costs to the initiating institution may be negligible.

Costs for reception of materials for an individual learner often fall on the learner, who may be expected to have a radio or, in an industrialised country, to obtain a computer. Where the distance-teaching system brings learners together there may be costs for the development or supply of specialist centres or equipment or negotiations for their use by learners (e.g. the supply of radios, development of videoconference facilities, the use of telecentres).

There will always be costs for the continuing support of students and arrangement for supervision of their classroom practice (where it is likely to be possible to use existing resources within the educational system, providing that the costs, including the opportunity costs, of this are acceptable). In the case of courses undertaken by individuals, in the interest of their own career development, these costs may be covered by a student fee. This element is perhaps the most significant in calculating the recurrent budget and identifying funds for it: it is both a recurrent cost and one that does not allow for economies of scale.

Funds will be needed for training and capacity building, especially as an unfamiliar project is being set up. As with initiation costs, this is an area where funds have often been obtained both from government and from external agencies. These are not, however, once-for-all costs: just as we argued for continuing professional development as an aim of teacher education so it will be necessary for those working in a specialist open and distance learning institution.

Finally, funding is not a once-off activity: maintenance of the whole system, of any equipment, and of teaching materials all incur costs. The costs of maintaining teaching materials, in particular, are often under-estimated at the outset: the effort needed to get them created the first time diverts attention from setting up a programme of continuing revision, improvement and updating.

Table 6.1 shows where resources have most often been located for these activities.

**Table 6.1: Activities and resources**

| *Activity to be funded* | *Type of funding required* | *Comments on possible sources* |
|---|---|---|
| Planning and initiation | One-off | May be from MOE funds but often also from funding and international agencies |
| Materials development | Funding mainly for staff time but can be treated as capital where materials are used over several years | Upfront funding usually from MOE, ngo or funding agency grants. Funds for revision and updating also required |
| Materials reproduction and distribution | Recurrent | Regular expenditure that may be recovered from operating grant or from student fees. Where distribution is through public broadcasting, government mail, or by internet, costs may be borne on other budgets. |
| Reception costs | May be some capital (e.g. supply of radios, development of videoconference facilities) but recurrent costs then arise | Initial funding may be from one-off grant (e.g. funding agency) Individual recurrent costs (e.g. maintenance of radios, computers) likely to fall on individual learner/centre |
| Student support and classroom practice | Recurrent | Regular expenditure that may be recovered from operating grant or from student fees. It may be possible for some costs (e.g. for deployment of school or college staff to support students) to be met from other institutional budgets |
| Training and capacity building | Recurrent | Heavy initial expenditure needed, especially where project is unfamiliar to those working in it, but continuing expenditure then required |
| Maintenance | Recurrent | Continuing expenditure that is often neglected (especially for materials updating) and needs to be built into budgets for previous areas |

## 6.3 Planners' guidelines for choosing between the options

Distance education for teachers has a patchy record, with many programmes started but abandoned, often because short-term funding arrangements could not be sustained. The record suggests several guidelines.

- The development of open and distance learning for teachers needs to take place within the framework of policy for teacher education generally so that questions about long-term funding are addressed at the outset.
- Even if it is assumed that the bulk of funds will come from government, it is worth considering the options of using alternative sources of funding, examining the trade-offs between them.
- In considering what, if anything, students should pay towards a course or programme, it is necessary to balance questions of equity and access (which suggest holding down student fees), questions of motivation (where learners may have medium-term rewards in terms of promotion), and questions of quality (which may demand expenditure above all on student support).
- Remember the maintenance issue.

## 7. How do teachers learn practical skills?

In chapter one we distinguished between four functions of teacher education. In one sense, all teacher education needs to be oriented towards the ways in which teachers support children's learning and so to the fourth of those functions, of strengthening teachers' practice in the classroom. But there are differences in the emphasis that has been laid on this function between different programmes. Where these are concerned simply to raise teachers' background education, or where they are designed to help experienced teachers learn about new subject-matter, classroom activities may be downplayed.

In asking about practical skills it is therefore legitimate to ask how far this is part of the role of a distance-education programme. The question is critically important for the planner for economic, logistical and educational reasons. The economic ones follow from the fact that the supervision of classroom practice is likely to be labour-intensive and will not show economies of scale. Indeed, if supervisors are to travel and visit teachers in their schools, then the costs of travel may be a significant part of the budget. The logistics are inevitably complicated and likely to involve a partnership of the kind discussed in chapter 4.4; a distance-teaching organisation will seldom itself have the staff to undertake this work so that it is likely to involve other partners who in turn need management, support and often training. From the educational point of view, changed activities within the teacher's own classroom are, as we have argued, of the essence of teacher education. This has implications not only for any teaching-practice component within a course but for its structure and content as a whole. Even theoretical elements of a course, including materials presented in print or on radio, can be designed so that they relate to classroom practice. Open and distance learning has a potential advantage in terms of integrating theory and practice where it enables practising teachers to raise their skills by study at a distance and it is worth seeking strategies that will maximise that advantage.

Conventional as well as distance-education programmes have, with varying success, confronted this need to turn what teachers know and believe into what they do to support children's learning. Many conventional programmes fail to attend to this and some produce teachers who are formally qualified but have had only a token or minimal supervised school experience. In some countries, practical teaching forms no part of the final assessment of teachers. The issues for a distance-education provider are about managing the supervision and assessment of students in distant locations and how to design materials and activities in ways which integrate knowledge or theory with practice. In the cases set out in chapter 3 we have examples of different strategies: a support structure for local action-groups of teachers (Brazil), delegation of supervision and assessment to school staff, with varying degrees of prescription and support (Nigeria, Britain, and UNISA in South Africa), the provision of teaching content, models and sequenced structure in the lessons provided for children (OLSET in South Africa), the design of course-work to require a practical application (Britain and Chile), the exchange of practical experience in workshops and newsletters (Mongolia and Brazil) or through websites (Britain and Chile), the demonstration of model lessons through television or video (China), the use of applied projects rather than examinations on theory and the inclusion of the assessment of performance in the final grade on formal programmes (Britain and Nigeria). Some of the projects place the practice of teaching at the centre of programme design and organisation, others assign it a relatively minor, or even marginal place, not because of the logistical difficulties involved for a distance education provider but because of the traditions and perceptions of teacher education in the different countries, and its role in conventional teacher-education programmes.



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In general, strategies to integrate theory with practice fall into the three categories identified by Robinson (1997):

- knowledge about practice (a teacher is able explain what multi-grade teaching is and produce an essay or examination answer on it);
- knowledge applied to practice (a teacher can plan the organisation of multi-grade teaching or materials for it and show how these might be used in the situation or report and reflect on work done);
- demonstration of knowledge and understanding through performance (a teacher shows the use of multi-grade teaching through the conduct of teaching and learning activities, observed by others).

The different categories have different logistical and cost implications for distance education. One danger here is that activities in the first category are (wrongly) assumed by programme providers to result in the outcomes found in the third (competence in performance) as a matter of course. The challenge for the planner is to design a programme so that knowledge is carried through from the first of these to the third and to build in a system of assessment and feedback that tests how successful the programme is in doing so. In many cases this involves more than, say, the integration of work based on classroom activity in assignments or videoconferencing sessions that look at classrooms and requires arrangements for a supervisor to see how teachers are working within their classrooms.

## 7.1 How can it be done?

We can identify five main approaches to the management and supervision of the practicum which are set out in table 7.1.

**Table 7.1: Models of organising the practicum in teacher training by distance programmes**

| *Model* | *Examples* |
|---|---|
| 1. No practicum offered at all | Certificate in Guidance, IGNOU (India) |
| 2. College-based micro-teaching | Belize Teacher Training College |
| 3. Classroom-based practicum as a separate block in a course, usually placed after academic blocks. | Diploma in Education, IGNOU (India), |
| 4. Classroom-based practicum supervised by visiting staff from college or ministry | Zimbabwe ZINTEC project |
| 5. Classroom-based practicum under the guidance of a mentor within the school | Open University (Britain) Postgraduate Certificate of Education |

For some programmes, an overt or tacit decision has been taken against any formal supervision or assessment of the practicum. This has often been the case, for example, where a programme is mainly concerned to raise learners' background education. In other cases, where programmes are aimed at experienced teachers, there is no formal practical element and therefore no need for a structure to supervise or assess it. The Certificate in Guidance by IGNOU, for example, inserts into the theoretical work suggestions about how to extend the ideas presented in the units into classroom practice but this is purely voluntary and not formally assessed.

In the second model, within programmes such as that of the Belize teachers' college referred to above (para. 4.3) the only practical work consists of college-based microteaching. This cuts down substantially on the organisational headaches of a school-based practicum but severely limits supervision and guidance of trainees' actual teaching.

The third model offers the practicum as a separate block of classroom-based teaching. The Indira Gandhi National Open University offers a Diploma in Education, for example, which has a one-off block of practical teaching after all the theoretical units. The government of Ghana has explored a model of teacher education in which students spend blocks of time working in a conventional college and blocks studying at a distance while they are working in school. This approach has the benefit of logistical simplicity, and allows cohorts of students to move from one mode of study to another. It does, however, run the risk that theory, done in one block of time, is unrelated to practice, done in another and that the guidance offered by tutors in college is seen as irrelevant by student teachers once they are working in schools. Close integration between the theoretical units and their practical pedagogical application becomes more difficult.

In the fourth model, trainee teachers follow a course while they are teaching and are visited, from time to time, by a supervisor from the college or from some other part of the teaching service. School inspectors, for example, have often been given this role. In principle this should make it possible both to integrate learning at a distance with practical classroom applications. In practice, logistical difficulties have often been overwhelming; in Zimbabwe, where this model was used, evaluation showed that supervision of this kind was the weakest part of the programme so that nearly all the students participating in one evaluation thought that field supervision was inadequate. Where inspectors were deployed to supervise, they had to change their role, sometimes with difficulty. Even college lecturers were reported to 'spend more time checking schemes of work and lessons plans rather than assisting students in the reinforcement of concepts, skills and linking theory with practice' (Chivore 1993: 59).

In the fifth model, school-based teaching is an integral part of the course, interspersed and often closely integrated with the theoretical units, and is supervised by a school-based monitor. In the case of the British Open University, outlined in chapter 3, the university decided to decentralise the supervision of classroom practice to individual schools. This was seen as a necessary strategy to enable students to enrol on the course regardless of where they were living but it also fitted with current national policy of moving towards school-based teacher education. The university undertook the job of briefing and training mentors, who were regular members of the staff of schools throughout the country, and paid them a fee which was a substantial proportion of the total expenditure on the course. The work of mentors themselves was supervised by the staff of the university's education faculty, working from its regional offices.

## 7.2 Where can it be done?

These five models locate teaching practice in different places. Management difficulties are minimised where it is centralised, as in the Belize example, which also made it possible to use relatively advanced – and expensive – television techniques for microteaching. If teachers are supervised in their own schools, by someone from the distance-teaching institution or one of its partners, it should in principle easier to ensure an integration between theory and practice. While in many instances there have been logistical difficulties in supervising classroom practice in this way either the third or fourth model is one that has most often been seen as appropriate and realistic.

The fifth model, of employing school-based mentors has attracted widespread interest. It depends on the availability of teachers within the system who have themselves sufficient experience and understanding of education to act as mentors, and a structure to brief and train them and to monitor their work. Many ministries of education, in considering this option, have rejected it as unrealistic as these conditions cannot be met. It has also been criticised as a system which serves to replicate the existing culture and values of the schools where the mentors and their trainee teachers are working. On the other hand, in discussing their experience, the Open University argued that their school-based approach meant that it was possible to ensure:

> that all the open and distance course text and resources should be directly related to school practice. No activity, reading or observation could be set that did not directly relate to experience in schools: the link had to be explicit. The course therefore also prescribes a *curriculum of school activities*... This school activities framework is directly related to the course structure and assessment model and allows for increasingly demanding activities, covering all aspects of the teaching role, as the programme progresses.
>
> Moon and Leach 1997: 5

## 7.3 Planners' guidelines for choosing between the options

This chapter has argued consistently the importance of asking how teachers will apply what they themselves learn in their own classroom, leading to the following proposals.

- Examine critically how far teachers will demonstrate and understand through their own performance the material they have been working on in their course.
- Plan appropriate arrangements for supervision of classroom practice in the light of that examination. Take account of the logistics and budget needed for this element.
- Explore where there are people or institutions who can help in managing and supervising classroom practice which will often necessitate a partnership with other institutions.
- Consider the balance of advantages of the options for the practice of teaching skills, their location, and the issues of who should supervise them and how those people should be supervised and trained.

## 8. How can you assess it?

There are three separate issues here: how we can make an assessment of open and distance learning as a whole; how we can build in a system of assessment or formative evaluation of quality control within the institution; how we can assess distance education for teachers. In the context of teacher education we look in particular detail at the last of these.

### 8.1 How do we assess open and distance learning?

In trying to assess the distance-education experience we are limited by the shortage of good evaluation. One can speculate as to why. Sometimes critical evaluations exist but are difficult to access because they are internal and confidential reports. Sometimes excellent evaluations that are in the public domain are buried within rabbit-warren generalist websites. But the overriding impression here is that distance and teacher education, both together and separately, are under-researched and under-theorised areas and particularly so in developing countries (Robinson, 1997). The dearth of evaluative literature seems partly to do with the difficulties of assessing a complex and interrelated range of factors related to effectiveness. The way that distance education disperses responsibility for a programme among a range of partners, sometimes on a large scale over distance–for student support, administration, tutoring, course production, delivery and assessment–presents a number of logistical and methodological challenges for researchers. In many countries it is hampered by limited research capacity and expertise, limited research culture, and limited funding. In programmes with a wide geographical reach, data from the centre often cannot tell us how well it is working at more local levels. Often the means for gathering data is problematic: researchers on the project in Chile (see chapter 3) commented that: 'The main constraint for researching the programme is the lack of an organised database with information about it. Even though the staff was open and willing to help, they did not have an easy way of getting some information and in some cases their memory was the only source available' (Cerda, Leon & Ripoll forthcoming).

In many countries it is hampered by limited research capacity and expertise, limited research culture, and limited funding. Funding may be the key: education spends less on research and evaluation than many other areas of human enterprise. The result is that policy makers have very little critical information on which to make informed decisions about teacher education by distance and providers have limited feedback from within their institutions to improve their practice.

Many evaluations have been narrowly focused, too. Studies of a necessary breadth 'demand intensive work on the ground and a greater commitment to evaluation than many authorities have felt able to give. For the most part, therefore, we have to rely on much more partial evidence' (Robinson 1997:133). We know that distance-education methods can be used on a scale that make a difference to national numbers in teacher supply but we do not know enough in terms of its effectiveness, curriculum and cost.

We have suggested, in chapter 2, the need to look at student numbers and completion rates, about evidence on learning gain or examination success, and about the effect of programmes on classroom practice and then, in order to make comparisons with conventional approaches, about costs. In all these areas we are short of data and evidence-based decisions about appropriate methodologies suffer as a result. More research and better research will make for better practice.



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## 8.2 How do we provide for quality control and formative evaluation?

Formative evaluation is likely to strengthen any educational institution. It has a particular significance for open and distance learning partly because its methods are complex and likely to involve many partners and partly because its students are distant, unseen, and often unheard. It is therefore necessary to build measures for quality assessment into all the processes of a distance-teaching institution. Many general guides on open and distance learning give advice on this which is not significantly different for teacher education from education for other purposes. In introducing a set of guidelines developed for higher education in Britain, for example, the Quality Assurance Agency has argued that:

> System design, programme design and delivery, student development and support, student communication and representation, and student assessment all raise particular questions for institutions about the ways in which they 'manage' teaching and learning to ensure that the quality of provision and security of academic standards are as they need to be...
>
> Distance learning must rely on a sound and effective logistical and administrative infrastructure to ensure that all participants' activities are co-ordinated and engage with the programme as designed by the provider. There is likely to be a distinct division of labour both in teaching and administration. An integral part of the teaching and administrative system is the timing of action and the lead times needed to meet deadlines. The guidelines place particular emphasis on these points.
>
> Higher Education Quality Council 1999

It goes on to propose that quality assurance should be examined under six headings: system design; programme design, approval and review; management of programme delivery; student development and support; student communication and representation; and student assessment. We examine the last of these below as it present particular difficulties in teacher education. Of the other areas, distance-teaching institutions have been particularly concerned to create appropriate systems to monitor system design, the development of teaching materials, and student support.

In assessing alternative proposals for system design it is necessary to examine how open and distance learning articulates with the rest of the educational system so that it provides a quality of education that matches the needs of students which is recognised as being on a par with conventional education. Furthermore, it demands a structure that monitors the processes of distance education to ensure that they are working effectively and efficiently for learners. Academic quality of the work at the centre is not enough: institutions also need to know how well their systems are working for communicating with students, for sending and responding to their work, and for maintaining student records.

There is now an extensive literature on the development of effective teaching materials for open and distance learning, in a range of different media, and a measure of agreement on the principles that underlie good instructional design. In designing an assessment system it is therefore appropriate to build in checks on the development and presentation of materials to ensure that they are pedagogically effective.

We have touched on some of the issues involved in ensuring effective student support in chapter 7 on classroom practice. Where teachers, studying at a distance, have themselves little experience as adult learners, or of learning outside a conventional classroom, they are likely to need

considerable support, offered through written comments on assignments, or electronically, or through face-to-face contact with tutors. Measures to monitor the quality and timeliness of this work need to be built into the system.

## 8.3 How do we assess distance education for teachers?

In chapter 7, in relation to teaching practice, we distinguished between three levels of teachers' knowledge and practice. In a valuable review of the problems, Robinson, has proposed the nature of assessment appropriate to each and its implications for distance education (Robinson 1997:130-3). She points out that the difficulties of assessing students working through distance education parallel the difficulties in using it for teaching. Distinguishing three levels of assessment, as in table 8.1, she points out that

> Knowledge and understanding are easier for a distance education provider to assess than practice and performance. Assessment of a student's pedagogical skills, the outcomes, is difficult for distance educators to do alone since it needs first-hand observation and authentication. As the model in table [8.1] shows it becomes more complex organisationally for a distance education provider and the costs rise, as assessment moves from Level 1 (knowledge and understanding) to Level 3 (practice and performance), that is from standard patterns of assessment of knowledge for large groups to assessment of individual performance and difference. One strength of distance education is its capacity to deal with large numbers, one limitation is its inability to deal easily with the individual.
>
> Robinson 1997

If we want to assess teachers' knowledge and understanding, which may be the main aim of a programme that concentrates on improving teachers' general education or their knowledge in one particular area, then there are no particular difficulties in assessing them through conventional tests and at a distance. Assessment can be built into written work relatively easily. Several of the projects discussed in section 3 arranged for assessment of this kind. It becomes more difficult if we move up one level and ask how far teachers are applying their knowledge to practice. It is, however, still possible to design learning materials, in a variety of media, that ask teachers to undertake activities in the classroom and report on them. This kind of student assignment makes it possible for the tutor both to guide the student and to assess how far knowledge has in fact been applied to practice. The third level, in which we ask how far teachers are in fact applying what they have learned in the classroom, is both the most difficult to manage and, as argued in the previous chapter, often the most important. Just as managing and supervising classroom practice present particular difficulties for open and distance learning so does its assessment. Again, if this centrally important kind of assessment is to be undertaken, a distance-teaching institution needs to work with partners on the ground, who will themselves need guidance and possibly training in their work. Efforts have been made, using a variety of approaches, to arrange this. The National Teachers' Institute in Nigeria produced a standard grid for assessment of classroom practice by external supervisors. At the British Open University, assessment of teaching practice, throughout the course, was a responsibility of the mentor and school co-ordinator. Students were required to keep a 'professional development portfolio' which included school practice assessments made by the mentor, which was

**Table 8.1: Assessing teachers' knowledge and practice at a distance**

| *Teachers' knowledge and practice* | *Nature of assessment* | *Implications for distance education* |
|---|---|---|
| Level 1: *Knowledge and understanding*<br><br>Of academic subjects to be taught<br>Of pedagogical concepts, ideas and theory | Written work (assignments), essays, course tests, final examinations | Can assess learning and give feedback to students on a large scale (hundreds or thousands).<br>Can achieve economies of scale (standard assignments).<br>Can provide well-designed assignments because of the resource put into course design; may also retreat into over-use of multiple-choice questions for administrative convenience.<br>Assignments may remain too theoretical or unrelated to the realities of classroom life, or lack regional relevance. |
| Level 2: *Knowledge applied to practice*<br><br>Application of knowledge to teacher's own context; testing out and interpreting ideas about pedagogy; evaluating practical activities and experiments, and reflecting on them | Written reports and accounts of things done (description and analysis of activities such as teaching a mathematical topic a new way; collecting evidence in a child observation study; organising a classroom differently; or developing new language and reading activities). | Good learning materials can structure this process for the teacher (distance not a barrier).<br>Can support linkage between theory and practice.<br>Not possible for a distance education provider to tell from the student's reports how authentic an account is given, for example, that classroom practice matches what is described.<br>Can be more time-consuming and expensive for a distance education provider to assess (non-standard assignments, greater individual differences). |
| Level 3: *Practice and performance*<br><br>Enactment of knowledge and ideas<br>Demonstration of competences and skills | Direct observation and authentication of individual teacher performance | Much more complex to organise and manage than Level 1.<br>More labour-intensive and expensive than Level 1; approximates more closely to costs of conventional training.<br>Requires more support staff in a variety of roles than Level 1; needs more staff training provision; more support materials; more monitoring and management.<br>Needs local partners. Cannot be done at a distance (without sophisticated interactive technologies). |

Source: *Robinson 1997*

submitted to the university at the end of the course for marking.

Like reconnaissance, time spent on the assessment of individual teacher assessment is never wasted.

## 8.4 Guidelines for planners

Assessment tends to be neglected. This chapter argues:

- Formative evaluation needs to provide information about the quality of open and distance learning generally, about the quality of the processes of a distance-teaching institution, and about the assessment of individual teachers.
- More good research is to be encouraged in order to guide practice.
- Systems of quality control need to address themselves to: system design, programme design and delivery, student development and support, student communication and representation, and student assessment.

- There are particular needs to look at the monitoring of day-to-day practice within the institutional system, at teaching materials, and at student support as well as at the assessment of individual teachers.
- This needs to look at the problems, in increasing organisational complexity, of assessing knowledge and understanding, knowledge applied to practice, and practice and performance.

## Annex: Sources of information and references

### Sources of information

*For further information it may be helpful to look at manuals on different aspects of open and distance learning, at its descriptive and analytical literature, and at a number of websites.*

### Manuals

A very useful, short, practical handbook in the IIEP Educational fundamentals series is:

Rumble, G. 1992 *The management of distance learning systems*, Paris: UNESCO/IIEP

A general guide to open and distance learning, from a mainly north American perspective, is:

Moore, M. G. and Kearsley, G. 1996 *Distance education: a systems view* Belmont: Wadsworth

There is an extensive literature about how to undertake and manage open and distance learning. One relevant series, concentrating on practical advice to people working in distance education, is the Kogan Page 'Open and distance learning series' with titles that include:

Freeman, R. 1997 *Managing open systems*, London: Kogan Page

Rowntree, D. 1994 *Preparing materials for open, distance and flexible learning*, London: Kogan Page

The Commonwealth of Learning (1285 West Broadway, Suite 600, Vancouver, BC, V6H 3X8, Canada; Phone +1 604 775 8200; Fax +1 604 775 8210; email info@col.org) has produced both a series of guidelines on topics that include the remote delivery of courses and training manuals for use in training distance educators, most of which include a set of case studies:

An Overview of Open and Distance Learning (278 pages)

Designing Materials for Open and Distance Learning (360 pages)

Planning & Management of Open and Distance Learning (408 pages)

Use and Integration of Media in Open and Distance Learning (396 pages)

Quality Assurance in Open and Distance Learning (290 pages)

Copyright & Distance Education: A trainer's toolkit (79 pages)

Among the demanding problems are those of training and rewarding writers of materials. International practice is analysed, leading to practical guidance for managers in:

Perraton, H. and Creed, C. 1999 *Distance Education Practice: Training and Rewarding Authors*, London: DFID Education Research Series, No.33

The manual on quality assurance in university distance education, referred to in chapter 8, consists of a set of six guidelines and 23 precepts together with a set of questions for the institution to ask about its arrangements for quality assurance. It is available on the Higher Education Quality Council's website.

Quality Assurance Agency for Higher Education 1999 *Distance learning guidelines,* Gloucester (http://www.qaa.ac.uk/public/dlg/contents.htm)

### *Other books and reports*

There is only a handful of books on the broad problems of teacher education especially in the developing world. They include:

Avalos, B. 1991 *Approaches to teacher education: Initial teacher training,* London: Commonwealth Secretariat

Dove, L. 1986 *Teachers and teacher education in developing countries* London: Croom Helm

Farrell, J. and Oliveira, J. 1993 *Teachers in developing countries: improving effectiveness and managing costs,* Washington D.C.: World Bank EDI seminar series

Greenland, J. 1983 (ed.) *The in-service training of primary school teachers in English-speaking Africa: a report,* Basingstoke: Macmillan

Hawes, H. and Stephens, D. 1990 *Questions of quality: primary education and development* Harlow: Longman

Rust, V. D. and Dalin, P. 1990 *Teachers and teaching in the developing world,* New York: Garland

Thomas, E. (ed.) 2002 *World Yearbook of Education 2002: Teacher education: dilemmas and prospects,* London: Kogan Page

UNESCO, 1998 *Teachers and teaching in a changing world,* Paris

UNESCO, 1998 *Training teachers to work in schools considered difficult,* Paris

UNESCO, 1995 *National languages and teacher training in Africa,* Paris

UNESCO, 1995 *Information technologies in teacher education: issues and experiences for countries in transition,* Paris

There is important and recent material, specifically about open and distance learning for teachers, in two recent books:

Perraton, H. 2000 *Open and distance learning in the developing world,* London: Routledge

Lynch, J et al. 1997 (ed.) *Innovations in delivering primary education vol. III of Education and development: tradition and innovation London*: Cassell (chapter by Bernadette Robinson)

There is some recent material on teacher education in:

Creed, C. 2001 *Distance Education in the E-9 countries,* Paris

UNESCO, through its Institute for Information Technologies in Education has produced an analytic survey on distance education:

N.C. Farnes 2000 (ed.) *Distance Education for the Information Society: policies, pedagogy and professional development,* Moscow: UNESCO-IITE

On open and distance learning for teachers there is a set of case studies, with comparative information on costs and outcomes in:

Perraton, H. 1993 (ed.) *Distance education for teacher training* London: Routledge

There is also a useful set of papers, focused on Asia but of broader relevance, based on a conference organised by the Asian Development Bank and the Commonwealth of Learning:

Asian Development Bank 1997 *Distance education for primary school teachers*, Manila

A volume in the Commonwealth of Learning's World review of distance education and open learning is in press for publication in 2002 and will provide a comprehensive and up to date survey of the area:

C. Latchem and B. Robinson (ed.) *Open and distance learning for teacher education*, London: Routledge

A short version of the case studies on which these guidelines are based is available from UNESCO:

Robinson, B., Creed, C. and Perraton, H. 2001 *Teacher education through distance learning: technology, curriculum, cost, evaluation*, Paris: UNESCO

It is anticipated that the full version of the case studies will also be published by UNESCO in 2002. A model case study of the use of distance education in Tanzania is published by the International Institute for Educational Planning:

Mählck, L and Temu, E B 1989 *Distance versus college trained primary school teachers: a case study from Tanzania* Paris: International Institute for Educational Planning

## *Websites*

UNESCO's education website contains a variety of downloadable material relevant to teacher education and the use of distance education: http://www.unesco.org/education/portal/e_learning/index.shtml. On the E9 initiative, addressing the needs of the nine high-population countries, see: http://www.unesco.org/education/e9/publications

There is a training package to assist primary school teachers to improve their multi-grade teaching skills at: http://www.unesco.org/education/primary/teachers.shtml

The International Bureau of Education, also has a databank of innovative educational programmes including teacher education and distance education projects. The website is at: www.ibe.unesco.org/international/datablanks/innodata/inno.htm

There is a website devoted to the needs of teachers run by UNICEF, containing articles opinions and research likely to be of interest to teachers at: http://www.unicef.org/teachers/build.htm

The World Bank has set up a Global Distance Education Net which contains papers on teaching and learning, technology, management, and policy and programmes. The website is at: http://www1.worldbank.org/_vti_bin/shtml.dll/DistEd/index.html/map2

The World Bank has also set up a Global Development Learning Network, an activity based at its training arm the World Bank Institute. Its activities are described at: http://www.gdln.org/

Information on its own research programmes in open and distance learning is available from the International Research Foundation for Open Learning at: http://www.col.org/irfol

The multi-site teacher education research project (MUSTER) run by the Centre of International Education, University of Sussex has a website with downloadable research papers on teacher education in a group of which embraced the use of distance education in Malawi: http://www.sussex.ac.uk/usie/muster

A free bimonthly newsletter on the use of information and communication technologies in education is produced by an American agency, Knowledge Enterprise Inc. The November/December 2000 issue focuses on the use of technology for teacher education. It is distributed electronically and is available at: http:///wwwTechKnowLogia.org

The British Department of International Development has set up a project concerned with the deployment of information technologies to support education in Africa. Its website has a resource bank of information which is at: http://www.imfundo.org

A major source of information about open and distance learning is the International Centre for Distance Learning, housed at the British Open University. It has a conventional library and a website which gives access to information about literature, courses, and institutions. The address is: http://icdl.open.ac.uk

## *Agencies*

Much of the material above derives from the work of the main international agencies concerned with education and in particular from UNESCO, which has primary responsibility for education, UNICEF, whose interests in education follow from its broad concern for children, and from the World Bank. There are two specialist, international, agencies whose function is to support the international development of open and distance learning and the sharing of resources internationally. They are the Commonwealth of Learning (1285 West Broadway, Suite 600, Vancouver, BC, V6H 3X8, Canada; Phone +1 604 775 8200; Fax +1 604 775 8210; email info@col.org) which works throughout the Commonwealth and the Consortium International Francophone de Formation à Distance (INTIF, 15 Quai Louis XVIII, 33000 Bordeaux, France, Phone +33 5 56 01 59 00, Fax +33 5 56 51 78 20) which works within francophonie. The International Research Foundation for Open Learning (Michael Young Centre, Purbeck Road, Cambridge CB2 2PG, England), which has produced this report, is a nonprofit research agency concerned with research to inform policy in open and distance learning.

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